

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper

Second-class postage paid at Framingham, Mass. and additional mailing offices ©1983 by CW Communications/Inc.

y; \$44/year

July 4, 1983

Vol. XVII, No. 27



American Bell, Inc. introduced its long-awaited Sceptre videotex terminal at Videotex '83 last week. Only hours later, a Canadian company announced a software package that appears to make the Sceptre obsolete. Stories on Page 10.

Expenditures for Personnel Growing Slower This Year

By Marguerite Zientara
CW Staff

FRAMINGHAM, Mass. — Communications and software/services are consuming an increasingly large portion of DP budgets at the expense of personnel costs, according to a recent study of more than 350 user sites by International Data Corp. here.

Staffing costs remain the largest portion of management information systems budgets, although they are steadily declining percentage-wise (Figure 1). Specifically, 1982-1983 staffing costs are expected to grow by only 12%.

Only two other categories — "Other" and "DP Supplies" — were lower, with both growing at 9%, IDC reported.

In contrast, software costs

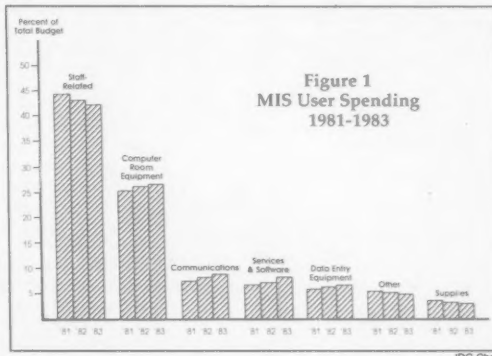


Figure 1
MIS User Spending
1981-1983

IDC Chart

in the 1981-1982 period grew by 22.6%, and communications costs grew by 21%. For 1982-1983, they are estimated to grow by 26% and 20%, respectively.

Spending on data entry

and computer room equipment will shrink slightly, growing 16.5% and 15%, respectively, for 1982-1983, compared with 1981-1982 rates of 20% and 17.2%.

(Continued on Page 4)

Threat to DEC's Olsen Triggers Fear for Execs

By Bill Laberis
CW Staff

What is the likelihood that the attempted extortion of \$1.25 million from Digital Equipment Corp. President Kenneth Olsen will be replayed elsewhere in the industry?

And what, if anything, are corporations that spend millions to protect hardware, software and trade secrets doing to protect their most valued assets — their top-level executive talent?

These questions emerged after the extortion attempt that began with a life-threatening letter demanding \$1.25 million from Olsen ended in Boston last week with the jailing of a U.S.



Army Green Beret (story on Page 6).

One security consultant contacted last week said computer industry executives are prime targets for life-threatening extortion attempts and other terrorist acts. The reason, he said, is

(Continued on Page 6)

Coordination the Problem

DSS-DP Conflict Worrying Users

By Paul Gillin
CW Staff

BOSTON — Organizational issues are on the list of nearly everyone faced with implementing a decision support system, according to users interviewed by *Computerworld* at the Third International Conference on Decision Support Systems held here last week.

Of primary interest is how to coordinate the DP func-

tion with that of DSS, which is often administered by a separate group, conference attendees said.

Conflict between DP and DSS is a major issue for Howard Popowicz of Standard & Poor's Debt Rating Services Division in New York, which has had a DSS for about two years. Popowicz was interested in "the level of user involvement in DSS vs. the 'guru' approach,

where one person makes all the decisions. We're also interested in user fairness — how far do you ask the user to go in developing applications?"

For James Burkhart, a resource analyst for the Idaho Power Co. in Boise, Idaho, the issues are "communications, both data and people. Utilities are famous for nobody talking to anybody," he

(Continued on Page 9)

Toxic Chemicals Force Del Monte to Abandon DP Site

By Jeffery Beeler
CW West Coast Bureau

SAN FRANCISCO — A \$3 billion food processing and distribution company shut down and temporarily abandoned its main computing center after a power transformer at corporate headquarters exploded and unleashed a cloud of toxic chemicals.

The explosion and subsequent fire, which occurred on May 15 in a large office building in San Francisco's financial district, caused no damage to Del Monte Corp.'s hardware, programs or data. Nor did the disaster injure any of the company's systems personnel or other employees, according to Del Monte's director of information resources, Fenwicke Holmes.

But the accident did trigger a chemical contamination scare that temporarily banished all 1,200 of the company's headquarters staffers from their work areas and prevented the employees from reaching their terminals. The result was that although Del Monte's IBM 3083-based configuration continued to operate without serious processing interruptions, the firm's users suddenly found themselves unable to gain access to any in-house systems resources, Holmes said.

During a June 27 interview in his company's One Market Plaza headquarters, Holmes likened the explosion to a neutron bomb blast, which takes a heavy toll on personnel but leaves property virtually untouched.

To restore the ties between the firm's users and their central processing system, Del Monte first had to find a new place for its displaced corporate staff to work. That problem overcome, the company began searching for new communications gear to replace the terminals, controllers and other equipment that the headquarters employees were forced to leave behind in their old office space.

Within a matter of days, Del Monte had laid the necessary coaxial cable and had installed new communications hardware in its makeshift corporate work areas, which "are located in office buildings scattered all over the city," Holmes said. During the same time frame, the firm also

replicated its entire telex and telegraph network "from scratch" and "scrounged" emergency key-to-disk machines from two large local businesses.

By May 23, eight days after the explosion, Del Monte's business and systems operations "had pretty much returned to normal," Holmes recalled. "The disaster was a huge inconvenience, but thanks to heroic efforts on the part of both our users and technical people, we were able to continue to meet our customer demands."

By no means, however, did Del Monte emerge from the accident unscathed. The frantic effort to replace the headquarters staff's abandoned

(Continued on Page 8)



THE NEWSPAPER FOR THE COMPUTER COMMUNITY

TM reg. U.S. Pat. Off.

Editor: John C. Whitmarsh
Managing Editor: Rita Shoor
News Editor: Cheryl M. Gelb
Technical Editor: Timothy J. Scannell
Senior Editors:
Software: Lois Paul
Communications: Phil Hirsch
Systems: Jim Bartimo
Office Automation: Ed Scannell
Industry: Jim Bartimo
Features: Bill Labaris
George Harrar
International Editor: Susan Blakeney
Writer/Analysts: Marguerite Zientara
Tom Henkel
Staff Writers: Paul Gillin
Katherine Hafner
Patricia Keefe

Correspondents:
New York: Bob Johnson
Washington, D.C.: Jake Kirchner
West Coast: Robert Batt
Jeffrey Beeler
Features Coordinator: Barbara Van Scoyoc
Chief Copy Editor: Donovan White
Assistant Chief Copy Editor: Kathie Gow

Copy Editors:
Dave Bouffard
Bruce Crane
Betsy Morse
Deborah Scaduto
Thomas Schmidt
Charlotte Ziemis

Assistant to the Editor: June Fetting
Editorial Assistants: Joyce Furia
Mary DeCristoforo

Contributors:
Education: J. Daniel Couger
Human Connection: Jack Stone
Lecht on Science: Charles P. Lecht
Software: Werner L. Frank

SPECIAL PUBLICATIONS
Computerworld Extra!
Editor: Bruce Hoard
Copy Editor: Patti Hartigan
Computerworld On Communications
Editor: Bruce Hoard
Copy Editor: Patti Hartigan
Computerworld OA
Editor: Ann Dooley
Staff Writer: Glenn Rifkin
Copy Editor: Nancy Fleming
Computerworld Buyer's Guides
Editor: Marcia Biementhal
Copy Editor: Rick LePage

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES

& SALES OFFICES:
New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Phone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-8064.
Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 347-4718.

England: Bill Dunlop, Stephen Thomas, Beech Hobson Assoc., 345 Gower Rd., Islington, London EC1V 1HN. Phone: 01278 341516.
W. Germany: Eckhard Updekel, CW Publications, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: 521530.

France: Axel Leblond, Le Monde Informatique, 42 Avenue Montaigne, 75008 Paris. Phone: 720 85 66.
Japan: Mr. Shigen Kuriya, Computerworld Japan, 7-4 Shintoshin 1-Chome, Chuo-ku, Tokyo 100. Phone: (03) 551-3882. Telex: 252-4217. Etsuhon H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jinbocho, Chiyoda-ku, Tokyo 101. Phone: (03) 230-4178. Telex: 126860.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crown Nest, NSW 2065. Phone: (02) 4395133. Telex: SECCO AA25468.

Brazil: Ite Hippo, Data News, Computerworld do Brasil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/106, Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 243-8225. Telex: 213080WED BR.

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (055) 514-4218. (055) 514-4359. Telex: 1771300 ACHAME, J777809 ACHAME.

Spain: Neil Kelley, Computerworld/España, Gravena, 13, Madrid 4. Phone: 231-23-85, 231-23-86, 231-23-88. Telex: 47946 CW E.

Denmark: Preben Engell, Computerworld/Denmark, Corneli Strand 50, 1202 Copenhagen K. Phone: 01-1234-11. Telex: 2756 CW D.

Sweden: Bengt Marfeldt, Computerworld/Sweden, Nova Media AB, Vattagavägen 15, 15138 Stockholm.
Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.l., Via Rosellini 12, 20124 Milano.

Second-class postage paid at Framingham, Mass., and additional mailing offices. POSTMASTER: Computerworld (ISSN 0010-0641) is published weekly, except February (5 issues), April (5 issues), May (5 issues), June (5 issues), August (7 issues), September (5 issues), October (7 issues), November (5 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications, Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Copyright 1983 by CW Communications/Inc. All rights reserved.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use, or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$0.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol: □

Special requests should be addressed to Nancy M. Shannon, CW Communications, Inc., Box 880, 375 Cochituate Rd., Framingham, Mass. 01701. ISSN 0010-0641/82 \$3.00 + \$0.50 a copy. U.S. — \$44 a year; Canada, Central & S. America — \$110 a year; Europe — \$160 a year; all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Capacity Planning Less Accurate

DP Execs: CPU Life Spans Shorter

By Tom Henkel
CW Staff

Newer, faster and more reliable processors, coupled with spiraling end-user demand for computing power, are apparently shortening most processors' useful life spans, DP executives told *Computerworld* recently.

Nine out of the 10 DP executives surveyed said their current processors probably will not last as long as expected. Moreover, the executives added, their long-term capacity planning efforts are not as accurate as they once were.

The DP executives said that on the average, their current systems will last between three and five years; two executives expect their systems to last only two years. Only one of the users polled expects to get seven years out of his processor.

Buying hardware today "takes a hell of a lot of planning," noted Jack Fulcher, director of data processing for GTE Information Services, the division responsible for purchasing all of GTE's commercial systems.

Large corporations have an advantage over smaller firms, he observed, because they can shuttle processors around to several sites, making them last longer.

But even with that option, Fulcher said, GTE Information Services has to do significant planning to make sure it buys the right hardware.

Separate Groups

GTE currently has separate groups to evaluate and purchase hardware. In addition, the firm subscribes to consulting services such as those provided by International Data Corp. and The Gartner Group.

Even with those resources behind it, the company has found that the average life span of a processor in one installation is about five years.

The John Hancock Mutual Life Insurance Co. in Boston once expected its larger processors to last about sev-

Some Suggestions on Planning

"Anytime you have to go to the boss two years later asking to expand or order a new processor, it doesn't go over too well," noted Alan Sarasohn, manager of customer support with BGS Systems, Inc., a Waltham, Mass., consulting firm specializing in processor evaluation.

Noting that a shorter processor life cycle is a common complaint among his clients, Sarasohn said capacity planning is not a hopeless cause, even though technology and the DP work load are both moving at a faster pace.

In most cases, DP shops have to expand to accommodate increased business growth. If top corporate brass would keep the DP department informed of plans to offer new products or services, comput-

er services to support those ventures would be much easier to plan, Sarasohn maintained.

However, corporations sometimes do not inform the DP department of changes in the business structure or product line until the last minute, presumably in efforts of preserving security. The head of DP operations, usually someone at the vice-presidential level, should be responsible enough to be privy to corporate secrets, Sarasohn said.

Furthermore, expansions in the DP department could be conducted without revealing company secrets to the entire DP staff.

Sarasohn recommended that DP executives look at their capacity planning every few months to determine how well it is working.

en years. Last year, that life span was cut to six years and that may be down to four years by the end of 1983, according to Senior Vice-President H. Alfred Colby.

Newer, better hardware is pushing John Hancock to install new processors at a faster pace, principally to support growing data bases and increased user requirements. But Colby thinks shorter processor life cycles are not necessarily a bad thing. The situation would be much worse, he maintained, if John Hancock were growing faster than the technology and could not meet its needs.

Large companies are not the only ones encountering shorter processor life cycles. Small and medium-size firms have had similar problems.

The Pacific Valves Division of Mark Control Corp. in Long Beach, Calif., for example, upgraded its Honeywell, Inc. processor two years after it was installed. Now the firm is planning to switch to a supermini-

computer in hopes of gaining more flexibility to deal with the rapidly changing processor market.

Pacific Valve's DP director, Grahme Jensen, hopes switching to a supermini will allow Pacific Valves to return to a five- to seven-year planning cycle. But "if history is any indication, we will probably be wrong again," Jensen said.

Armstrong Rubber Co. in New Haven, Conn. recently cut its processor planning cycle from five to three years, according to C.R. Pepitone, the firm's director of information services.

Armstrong quadrupled its processing power when it switched from an IBM 370/145 processor to a 4341 several years ago. That increase should be adequate for the near term, but for the future, Armstrong is going to evaluate its processors according to their potential useful lives and approximate value at the end of that life cycle.

This Week

NEWS

Software Still Missing for DEC's Pro Micros	4
Honeywell Eases Mini-to-Supermini Upgrade	6
Second Version of System 85 PBX Released	8
Express DSS Linked With '1-2-3' for IBM Micro	9
American Bell Unveils Videotex Terminal	10
Results of World Games Out in Record Time	11
Terminals, Peripherals Debut at Graphics Meet	12
CAD/CAM Hot Topic for Show Attendees	13
International Report	14
Users Group Considering Seeking Independence	15
Ford Exec Sees Micros Taking 'Center Stage'	19
Scottish University Increasing Strides in AI	23

EDITORIAL

Editorial: Your Unacceptable Alternative	24
Sottline: Why a Micro-Mainframe Connection?	25
Human Connection: Micros Need Planning	25
Reader Commentary: Coding Clarity is Key	28

SOFTWARE & SERVICES

End-User Training Implementation Examined	29
Firm Announces Price Hikes	32
Release 1.2 of 'Mage' Out for OS, DOS Users	33
UCC-1 Tape Management Updated With Release	35

COMMUNICATIONS

Progress Seen Likely in Standardization	37
Tri-Data Offers Z80-Based Processor	38
Line Expander, Converter Offered	40
Comdesign Introduces its TM Series of Modems	44

SYSTEMS & PERIPHERALS

HP Customer Service Ranks High: Study	45
CDC Seeks Full Integration of CAD/CAM	47
IBM Adds Graphics to Series/1 Videotex System	48

OFFICE AUTOMATION

Prime Unveils Micro-Based Workstation	49
Portable Systel I Debuts	50

COMPUTER INDUSTRY

New Rules Ease High-Tech Trade With China	51
MSA to Buy Software Division	51
Cary Retires; Ends 35 Years as IBM Exec	52
Birth Pangs of U.S.-China Tech Trade Diagnosed	54
Micropro Files Suit Against United Computer	55
Litigator Defines Monopolistic 'Tie-In' Violation	56
Attorney Draws Antitrust Litigation Bottom Line	57

ADVERTISING INDEX

82

Today's smartest program development system just got smarter

ADR/ROSCOE/ETSO™

Now you can timeshare
acquired applications or user-developed
programs without modification

The maintenance of an effective Information Center, a concept that ADR has made a reality, requires a powerful and flexible host system. In short, ADR/ROSCOE with ETSO, the new Extended Time-Sharing Option.

ETSO supports acquired interactive application systems, user-written interactive applications and functions, or standard batch utilities. ETSO offers time-slicing and maximum CPU control. Memory acquisition protection. Dynamic allocation of ADR/ROSCOE files and external data sets. Transparent I/O to ADR/ROSCOE files, and site security and accounting.

ADR/ROSCOE, today's foremost interactive program development system for IBM OS environments, is installed at more than 1,200 sites around the world. Its single-mode environment includes: data entry with full- and multi-screen editing. Self-reorganizing library storage. Programming language and JCL syntax checkers. Full background job interface. Conversational data management utilities. Interactive high-level procedural language with an integrated panel facility. Applications prototyping facilities.

Write or call for more information about ADR/ROSCOE/ETSO, part of ADR's integrated fourth-generation software.

APPLIED DATA RESEARCH, Route 206 & Orchard Road, CN-8, Princeton, NJ 08540, (201) 874-9000.



 **APPLIED DATA
RESEARCH**

**Information
Center:**
EMAIL, EMPIRE, ETC,
DATAENTRY, IDEAL,
ROSCOE/ETSO,
DATAREPORTER,
DATAQUERY

**Development
Center:**
ADR/DL, VOLLIE,
DATAREPORTER,
The LIBRARIAN,
MetaCOBOL,
ROSCOE,
IDEAL

**Production
Center:**
DATACTIONARY,
DATACOM/DB, D-NET,
DATACOM/DC,
DATA DESIGNER, LOOK

Software Still Missing For DEC's Pro Micros

By Jim Bartimo
CW Staff

Digital Equipment Corp.'s delay in shipping software for its 16-bit Professional 325 and 350 microcomputers earlier this year is showing up now as a drop in sales of those machines, industry experts told *Computerworld* recently.

However, a DEC spokesman maintained that sales of the two micros are "right on target."

But while the industry experts agree that software packages for most applications are now available from independent software firms for the Professionals, DEC has yet to ship much of its own software.

Signs of trouble concerning the two micros arose six months ago [CW, Jan. 24] with reports of hardware delays from users and dealers alike. There were also software snags: a version of Visicorp's Visicalc electronic spreadsheet package for the Professionals was not expected to be ready until March (it has still not been released), and the only word processing available was a basic text editor. True word processing could only be had through the use of an 8-bit card and DEC's Select package.

At that time, everyone from DEC to Visicorp predicted that a library of

software would emerge "in a few weeks," "within six months" and "by March." While third-party software vendors have released word processing packages — Lex-11 from EEC Systems, Inc., for example — Visicorp has yet to release Visicalc for the Professionals.

Contacted recently, Visicorp could still give no specific date for the release of the Professional version of Visicalc. Moreover, a spokesman said the company will release only an advanced version of Visicalc and only for the Professional 350 (see story below).

A number of spreadsheet packages are available from third-party software vendors, including Maps/Pro from Ross Systems, Inc. and Supercomp 20 from Access Technology, Inc., according to Allan Brewster King, product manager for Microcon Software Center, Inc., a DEC dealer in Watertown, Mass.

There is currently little software available from DEC itself. "We have software development going on, but for now we're relying on third-party developers," the DEC spokesman said.

Part of the problem in producing software for the Professional seems to be the complex P/OS operating system that was intended to make micro-to-mainframe file exchange easy, according to industry analyst Don Brown, a vice-president at Shearson/American Express Inc.

The DEC spokesman confirmed that an enhancement for P/OS is scheduled for release this summer and that an additional "dozen or more" application packages will be available for it.

While the operating system may be a liability today, it is still preventing an erosion of DEC's present customer base and may give DEC one of the few truly integrated micro-to-mainframe product lines around, Brown said. "DEC will be in a much better position in a year," he predicted, "when people start tossing files back and forth on other machines."

DEC's customers may be satisfied with the eventual outcome, but new and retail customers may be gone for good. "We're very disappointed in the approach taken by DEC and the problems they've had in getting the software out," Brown said. "IBM is gunning the market, so I think that the retail outlet success for DEC will be limited."

Even the most enthusiastic DEC-supporting retail outlets admit that sales of the Professionals dropped when customers could not see the software except on a demo. "The unavailability of software set the Professional line back six months," Microcon President Barry Passen said. "Around the time of the Superbowl, DEC did all that advertising for the Professional with all that software being shown on the TV screen. When people came in, we didn't have it."

Passen expects a rush of software "in a few weeks," but, like Computerland of Boston, has switched his sales emphasis to DEC's entry-level machine, the Rainbow.

People Problems, Complex System Cited in Delays

WELLESLEY, Mass. — "People problems" and a too-complex operating system are the reasons that software for Digital Equipment Corp.'s 16-bit Professional microcomputers has been delayed, a third-party software developer said in a recent interview.

The "people problems" cited by Daniel Bricklin, chairman of Software Arts, Inc., and one of the first authorized third-party software developers for DEC's Professional 325 and 350, center on DEC's relations with his firm and other such developers.

"For instance, there was a problem on where to put the seal from DEC on the box that shows you're an authorized developer," said Bricklin, who is co-inventor of Visicorp's Visicalc. (Software Arts does not have the marketing rights to Visicalc, but it develops new versions of the spreadsheet program for Visicorp and markets its own package, a business and engineering tool called TKISolver.)

Moreover, the Professional is "a 256K-byte [main memory] machine, but the operating system takes up a lot of memory." As a result, there is not as much room for software in the memory as there is with some other micros.

Software Arts' version of TKISolver for the Professional will ship almost on schedule next month, but it would have shipped earlier if the problems cited above had not arisen, Bricklin said.

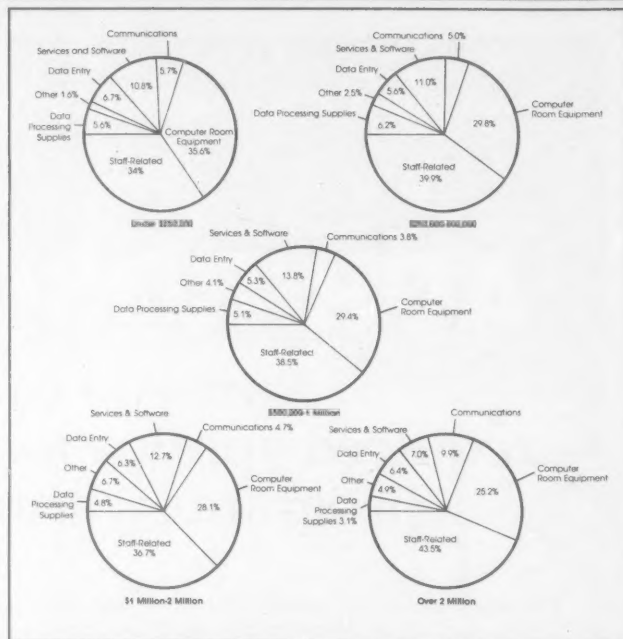


Figure 2: 1983 Expense Categories by Budget Size

Growth in Personnel Costs Slows in '83 User Budgets

(Continued from Page 1)

These were the major findings of "Industry Preview: User Spending," based on a survey of more than 350 installations in 13 industries. The survey tracked actual DP spending for 1981 and 1982 and planned expenditures for 1983.

Besides the survey data, IDC used its data file of computer installations, financial and other publicly available vendor data and vendor-supplied shipment data to identify spending trends.

According to IDC, the budget shifts can be traced to prevailing trends in five areas: economic conditions, personnel shifts, user involvement, communications growth and software growth. "Obviously, the recessionary economy has restricted the growth rate for information processing within most businesses," the study pointed out. "Except for dramatic changes in some market sectors, budgets will stay conservative for the remainder of the year."

Continuing Shift

With hiring freezes and delays commonplace, there has been a continuing shift toward a higher professional level and more technically versatile staff, IDC noted. "This trend has coincided with the increased activity in information processing by users, especially in areas such as user-controlled data entry and micro-level equipment."

The increase in users within an organization has resulted in greater demands for equipment and access to corporate data. "Along with improved technology and lower equipment costs, these factors have continued to stimulate growth in communications and software," the study found.

Generally, the spending trends identified are applicable to all budget sizes (Figure 2): under \$250,000;

\$250,000 to \$500,000; \$500,000 to \$1 million; \$1 million to \$2 million; and over \$2 million.

The lower end of the budget size groups tends to spend a higher proportion of its budgets on computer room equipment and software/services, the study reported. For budgets under \$250,000, the IDC study found that the 1983 computer room equipment spending was 35.6%, compared with the overall 26.3% for 1983 and the 25.2% for budgets over \$2 million.

The smaller size budgets also tend to spend a smaller proportion on communications and data entry, according to IDC. For the \$250,000 to \$500,000 group, 5% of the budget was allocated to communications; the over-\$2 million group allocated 9.9% for 1983. The overall percentage for 1983 communications costs was 8.7%.

Biggest Spenders

Among the 13 industry groups, durables and health/medical services reported the highest percentages for 1983 staff-related expenses — 45.1% and 49.2%, respectively, compared with the overall total of 42.2%.

Service bureaus reported the highest percentages allocated to communications expenses (20%) for 1983, compared with the overall total of 8.7%. However, most of the other expense categories were below the overall percentages, IDC reported.

Educational institutions showed a decreasing trend in computer room equipment spending over the three years, unlike the increasing overall trend in that category.

Among the 13 industry groups, government reported the highest proportion allocated to computer room equipment (29.9%), but was more than 4% below the total of 42.2% for staff-related expenses, according to the report.

INTRODUCING



EQUITABLE LIFE LEASING CORPORATION

• A new name • A new direction

(Formerly Equico Lessors)

We have a new philosophy, new headquarters and new services. At Equitable Life Leasing Corporation, we have the financial resources and expertise to meet all your leasing needs. We offer:

- Operating leases • Tax priced leases • Vendor lease programs

We are a subsidiary of

The Equitable Life Assurance Society of the United States, N.Y., N.Y.



For more information call any of the offices listed below

Atlanta

Building E, Suite 623
5775 Peachtree-Dunwoody Road
Atlanta, GA 30342
(404) 256-2434

Boston

40 William Street
Wellesley Hills, MA 02181
(617) 237-3660

Chicago

1111 East Touhy Avenue, Suite 340
Des Plaines, IL 60018
(312) 296-6030

Cincinnati

8180 Corporate Park Drive, Suite 200
Cincinnati, OH 45242
(513) 489-3900

Cleveland

5755 Granger Road, Suite 330
Cleveland, OH 44131
(216) 398-4800

Dallas

1330 Greenway Drive, Suite 225
Irving, Texas 75062
(214) 659-7930

Denver

Colorado Center, Suite P307
1777 South Harrison Street
Denver, CO 80210
(303) 761-3290

Detroit

6715 Telegraph Road, Suite 285
Birmingham, MI 48010
(313) 646-9333

Houston

6200 Savoy Drive, Suite 440
Houston, TX 77036
(713) 977-5761

Kansas City

Building 51, Suite 410
9393 West 110th Street
Overland Park, KS 66210
(913) 642-8450

Los Angeles

6615 E. Pacific Coast Highway, Suite 200
Long Beach, CA 90803
(213) 493-5431

Milwaukee

250 North Sunnyslope Road, Suite 340
Brookfield, WI 53005
(414) 785-9797

Minneapolis

7151 Metro Boulevard, Suite 175
Minneapolis, MN 55435
(612) 944-8740

New York

One Garrett Mountain Plaza
West Paterson, NJ 07424
(201) 881-8200

Philadelphia

Merion Towle Building, Suite 204
1777 Walton Road
Blue Bell, PA 19422
(215) 628-0350

Phoenix

4561 East McDowell Road
Phoenix, AZ 85008
(602) 275-0194

Pittsburgh

Manor Oak One, Suite 340
1910 Cochran Road
Pittsburgh, PA 15220
(412) 343-8122

St. Louis

One Centerra Plaza, Suite 216
St. Louis, MO 63101
(314) 621-6732

Seattle

11008 Main Street, Suite 120
Bellevue, WA 98009
(206) 455-3723

San Francisco

The Alcoa Building, Suite 1200
One Maritime Plaza
San Francisco, CA 94111
(415) 982-0818

SUBSIDIARY

EQUITABLE/OMNILEASE CORPORATION

San Diego

10251 Vista Sorrento Parkway, Suite 300
San Diego, CA 92121
(619) 453-0881

Boston

255 Bear Hill Road
Waltham, MA 02154
(617) 890-4000

Philadelphia

Merion Towle Building, Suite 101
1777 Walton Road
Blue Bell, PA 19422
(215) 646-6300

Silver Springs

8630 Fenton Avenue
Montgomery Center Building, Suite 621
Silver Springs, MD 20910
(301) 792-4833

CORPORATE HEADQUARTERS

10251 Vista Sorrento Parkway, Suite 300
San Diego, CA 92121
(619) 453-0881

Enhances Entry-Level DPS 7

Honeywell Eases Mini-to-Supermini Upgrade

By Ed Scannell
CW Staff

WALTHAM, Mass. — Honeywell, Inc. last week introduced an enhanced version of a low-end system in its DPS 7 family of 32-bit minicomputers. The new system is aimed at strengthening the upgrade path to DPS 7 superminis from the Level 62 minicomputers.

The DPS 7/35E is similar in performance to the DPS 7/35, introduced in 1981. Unlike the 7/35, however, the enhanced system contains a mass storage processor that reportedly permits it to use Honeywell's 80M- and 300M-byte removable disk units without any modifications — a capability not previously available to DPS 7 users.

Basically, the mass storage processor allows Level 62 users to take along their disk files when moving to a DPS 7 supermini.

Besides unveiling the 7/35E, Honeywell last week also announced:

- An entry-level version of its Gcos operating system. Gcos-ES can be used with the low-end DPS 7/35, 7/35E and 7/45 processors.

- An enhancement of its query processor data management tool, containing a Query Report Option module that is said to allow users to customize report formats more easily.

- A 20% to 36% reduction in purchase prices on DPS 7-compatible hardware products. For example, 1M byte of add-on memory now costs \$10,000; a 200M-byte mass storage device has been reduced to \$19,000; 600, 900 and 1,200 line/min printers are now selling for \$14,585, \$29,500 and \$34,500, respectively; and a 120 char./sec console printer has been reduced to \$4,100.

The DPS 7/35E announced last week is capable of storing up to 3M bytes of data in main memory and up to 7.4G bytes of memory on disk, according to Honeywell. It performs

the same functions as the DPS 7/35 and is fully compatible with all other DPS 7 machines. In addition, it can be field-upgraded to the top-of-the-line DPS 7 system.

Besides the mass storage processor, the 7/35E contains two recently developed 9-track, 1,600 bit/in. magnetic tape units that the system supports by way of a new tape adapter. As many as four of the tape units can be connected to a system, a spokesman noted.

An unadorned DPS 7/35E configuration with 2M bytes of main memory, a mass storage processor with 600M bytes of disk storage, a 600 line/min printer and adapter, a 120 char./sec printer and three communications lines is priced at \$223,266.

For Level 62 users transferring their existing disk drives to the 7/35E, the same configuration costs \$166,266. First shipments of the system are expected in the fourth quarter of this year.

The entry-level Gcos-ES is meant to be a stepping-stone, enabling new DPS 7 users to graduate to larger DPS 7 Gcos systems, according to Honeywell. The software can support as many as 24 terminals simultaneously; it is also capable of running two batch jobs at the same time while supporting five time-sharing users.

The operating system comes with a Cobol compiler and has file access and control utilities, as well as distributed processing and transaction processing facilities. Users can add Fortran, RPG and Basic languages to their programming repertoire, the company said.

The Gcos-ES operating system will be available in October for a monthly licensing fee of \$1,150, while the Query Report Option is available for \$100/mo, plus a \$30 monthly expanded support charge.

More details are available from Honeywell at 200 Smith St., Waltham, Mass. 02154.

Threat to Olsen Triggers Security Concerns

(Continued from Page 1)

that many are company founders who have amassed great wealth relatively quickly and are unaware of the vulnerability that such wealth brings. Others "came up through the ranks thinking that petty theft was the worst thing they'd encounter," he said.

And unlike other economic sectors, the computer industry "is characterized by a more carefree corporate environment and attitude, at least compared to the older industries," said Joseph Malley, director of management consulting at Burns International Security Services, Inc. in Briarcliff Manor, N.Y.

Moreover, Malley said, it is hard to sell most executives on a beefed-up corporate security plan because "the typical U.S. executive is not sufficiently aware of what could happen to him... There haven't been enough occurrences, such as what happened at DEC, to sensitize them to the point where they take their personal security seriously.

"It's a heck of a big headache for internal security directors," added Malley, whose business is selling security.

Partial Agreement

One security director of a large multinational computer company, who requested anonymity, agreed in part with Malley. This director, a former FBI agent, said computer industry executives "find it very difficult to accept the fact that they are in positions of power that make them potential targets" of extortionists, terrorists and kooks.

However, he disagreed with Malley that computer industry executives are more likely to be attacked than other industrial executives. "The relatively low profile most computer executives maintain protects them somewhat against these incidents," he explained.

"Often it is the chief financial officer or human resource chief that is

Green Beret Charged in Extortion Attempt

BOSTON — A bizarre plot that began with a life-threatening letter culminated with the jailing last week of a Green Beret charged with attempted extortion of \$1.25 million from Kenneth Olsen, president and founder of Digital Equipment Corp.

U.S. Army Staff Sgt. Marc E. McDonnell, 27, is being held on \$100,000 bail pending a probable cause hearing July 6, when he will answer charges brought by the Federal Bureau of Investigation. The demolitions expert is alleged to have sent Olsen two life-threatening letters and is suspected of blowing up telephone poles near Olsen's Lincoln, Mass., home in a show of force and intent.

According to the FBI and its complaint, Olsen received a hand-printed note on June 2 requesting an 18-month, interest-free "loan" of \$1.25 million. The letter claimed its author was a member of a paramilitary group "perform-

ing still-classified dirty work in Southeast Asia, Africa, Central and South America."

The letter stated the group was soliciting "loans" from some of the "wealthiest people in the country," while threatening a "demonstration of... seriousness in this matter." The letter concluded by saying that Olsen's failure to accede to demands would mean he "will die and we will move on to someone else... there will be no second chances."

Police, FBI Informed

Olsen told local police, who informed the FBI of the threat. Two days later, black detonating cords wrapped around two telephone poles near Olsen's home exploded. No one was hurt.

Four days later, on June 8, Olsen received a second written communication with instructions detailing where and how the money should be delivered. But

the delivery date was June 7.

FBI agents staked out the drop-off site the evening of June 8 and trailed a man, later identified as McDonnell, and a woman and child in their car from the site to nearby Ft. Devens, where McDonnell lived. A search of McDonnell's trash bin the next day produced a draft of the demand letter with McDonnell's fingerprints, the FBI said.

Government agents obtained an arrest warrant on June 16, but McDonnell was with his Army unit in West Germany. Military officials sent him back to the U.S., where he was arrested a week later and charged with the extortion.

Spokesmen for both the FBI and the Army said they were not certain if McDonnell was part of a larger paramilitary group. They offered no comment when asked if other ranking industry executives have been threatened in a similar manner recently.

the target of threatening calls and letters," he added. "And often the responsible party is an unhappy employee or investor."

Detailed Plans

Of several major computer vendors contacted last week, each said it employs detailed personnel security plans extending to the executives' homes and travel schedules. The security measures have been prompted in part by threatening letters and calls received occasionally by corporate executives. For obvious reasons, the vendors declined to discuss details of their security measures.

Joel Watson, assistant to Burroughs Corp. Chairman W. Michael Blumenthal, said Blumenthal has re-

ceived threats "from time to time," but "nothing as serious as what happened to Olsen." Many of the threatening calls and letters screened from Blumenthal's mail have been traced to internal sources, generally a disgruntled employee, Watson said, adding that all such matters are turned over to Burroughs' internal security force.

Many industry executives held ranking posts in the federal government, possibly increasing the likelihood of being a target for threats. Blumenthal served as Treasury Secretary under former President Carter; David Packard, co-founder of Hewlett-Packard Co., served as Deputy Secretary of Defense.

IBM executives have also been the targets of threatening letters and

calls, "although very infrequently," an IBM spokesman said. As at Burroughs, corporate security matters at IBM are handled by an internal security force augmented by outside protection agencies for certain functions and corporate travel plans, the spokesman said.

One leading West Coast computer vendor is said to have installed bullet-proof glass in its executive dining area. This action followed a recent death threat lodged against the company's chief executive officer.

"Physical barriers to the executive suite, like bullet-proof glass or steel-reinforced doors, are not unusual parts of corporate security plans today," said Burns International's Malley. "This is part of the price you pay for getting to the top."

LONE EAGLE

SyncSort CMS:

**It's a species
all by itself!**

**(The only high-tech
sort for VM/CMS.)**

Call (201) 568-9700.

**Liberate your
sorts and your
programmers.**

SyncSort CMS Performance Improvements

**VTIME: 50%
TTIME: 60%
SIOs: : 75%**

syncsort
INC.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

What is that soaring so effortlessly up there in the data-processing heavens? Is it a bird? Is it a plane? Is it a man?

Nope, it's a Supersort – SyncSort CMS. And it does for VM/CMS what other versions of SyncSort have done for OS/VS and DOS/VS(E).

A couple of years ago there was no such animal as a high-performance sort program for VM/CMS. As a result, certain kinds of processing were just plain impossible with the system. It's a miracle that VM/CMS survived at all.

Then SyncSort CMS was hatched. It was the first and only sort program designed exclusively for VM/CMS. And it gave leading-edge processors a powerful tool for liberating the potentialities of their system.

In a little over a year, SyncSort CMS has acquired over 350 users. It's growing at a faster rate than either SyncSort OS or DOS were at a similar stage in their development. Here are some of the reasons for that astonishing growth:

1. SOARING PERFORMANCE. SyncSort CMS includes many of the technical breakthroughs we pioneered in OS and DOS sorting – innovations that are now patented.

The best way to find out what this revolutionary new sort program can do for you is simply to try it. You'll be amazed at how little VTime, TTime, Elapsed Time and SIOs it requires. You'll note a sharp drop in response times and a surprising increase in system throughput.

2. FINE-FEATHERED FEATURES. SyncSort CMS liberates programmers. Using the program's full range of features, you can often produce a simple report in one day rather than five. These can do the following:

- Select relevant records;
- Reformat records on output;
- Perform summaries of designated numeric fields;
- Produce reports with pagination, headings, dates.

3. GREATER VERSATILITY. SyncSort CMS is a bird for all seasons:

- It can be invoked from other COBOL, PL/1 or BAL programs.
- It sorts CMS, SAM (OS or DOS) or VSAM files.
- It dynamically allocates space on TDSK.

4. TOP-FLIGHT SERVICE. Ours is the best in sorting. More than 85% of all inquiries are resolved within 24 hours.

If you'd like to realize the full potential of VM/CMS, give us a call, and we'll introduce you to SyncSort CMS. It's a great chance to replace a vulture with an eagle!

Second Version of System 85 PBX Released

By Bob Johnson

CW New York Bureau

NEW YORK — American Bell, Inc.'s Advanced Information Systems Division announced Release 2 of its Dimension System 85 here last week, along with two new terminals for the voice/data private branch exchange (PBX).

Release 2 adds a new 501CC processor and reportedly offers nearly eight times the line capacity of Release 1, announced in January. It also provides distributed communications capability for larger communications users and a T-1 carrier interface for data applications at high-speed digital transmission rates of 1.544MHz, American Bell said.

The new terminals include the 515 Business Communications Terminal (BCT), an integrated voice/data workstation that accesses the system's voice, messaging and office functions and compatible hosts; and

the 513 BCT, an asynchronous data-only display terminal.

Release 2 of System 85 increases system capacity from 900 to 7,000 stations in a single location, American Bell said. In addition, the company noted that with its Distributed Communications System (DCS), users could have up to 25,000 fully featured stations in geographically separate locations anywhere in the country.

According to Frank Vigilante, division president for product planning and development, the DCS capability allows large corporations to operate two to 12 System 85s as a single system within a building, campus, metropolitan area or even nationwide, with full features and distributed control. Because each processor can function independently if necessary, Vigilante said, users can start with two and add more as their needs expand.

"This announcement follows through with our pledge to current Dimension PBX users to evolve the product line in a consistent way," Vigilante added. "With DCS now on System 85, customers can mix Dimension PBX Feature Package 8 and System 85 in DCS configurations."

Integrated Format Provided

The T-1-compatible interface provides users with an integrated format for multiplexing 24 channels of 64K bit/sec digital transmission onto one carrier, according to American Bell. It also permits modeless switched digital connections between two System 85s, including DCS configurations.

The processor for Release 2, the 501CC, controls a Time-Multiplexed Switch (TMS) that provides the link between the circuit-switching modules. Fiber-optic links between the TMS and the modules transport digi-

tal information at 32M bit/sec.

Vigilante noted that users are also being provided with the option of a 160M-byte hard disk instead of the standard 40M-byte unit on the applications processor for both System 85 and Dimension FP8. He claimed that this allows for larger electronic directory capacities, more call detail processing and added capabilities for electronic document communications users.

A 400-line configuration of Release 2 is priced at \$429,203. With distributed communications capabilities and 6,200 lines, it is priced at \$5,390,234. The 515 BCT costs \$3,385, and the 513 terminal costs \$2,020.

General availability for all products is scheduled for December 1984. More information is available from American Bell Advanced Information Systems, 100 Southgate Pkwy., P.O. Box 1955, Morristown, N.J. 07960.

Chemical Explosion Forces Del Monte to Abandon Site

(Continued from Page 1)

hardware and reconnect users to their on-line systems consumed so much of the company's energies that it was forced to suspend all internal development activities, according to Holmes.

Only now is the firm's systems development operation beginning to return to customary levels of activity. During the roughly seven weeks that Del Monte's application programming ground to a halt or proceeded at less than full speed, the organization lost an estimated seven man-years of systems labor.

"We'll never be able to recover that lost time, and we're now having

to reexamine our development schedule," Holmes said. "The full implications of the disaster are still being assessed."

The explosion also forced the company to shut down completely its business on May 16 and led to the June 17 decision to relocate Del Monte's corporate computing facility to another office building in the city.

On July 8, the corporation is scheduled to transfer its main data center some 600 yards to a work space currently belonging to On-Line Business Systems, Inc. The move, which local public health officials approved June 18, is expected to be complete July 10.

Circulation System, New CPU Credited With Saving the Day

SAN FRANCISCO — A well-designed air circulation system and a recent upgrade to a new processor prevented a serious accident at Del Monte Corp.'s world headquarters from mushrooming into a catastrophe.

Del Monte's corporate computing center escaped detectable contamination on May 15 when a power transformer exploded in the basement of the firm's seven-year-old, 14-story headquarters building. The explosion produced a fire that vaporized the transformer's coolant, a suspected cancer-causing agent known as polychlorinated biphenyl (PCB), and contaminated the building's basement with toxic chemical fumes.

At the first hint of smoke, the office complex's two central air circulation systems turned themselves off, as they were designed to do. The quick shutdown prevented PCB vapors from filtering through the building's maze of air ducts.

"Our circulation system really saved our rear ends," remarked the company's director of information resources, Fenwicke Holmes.

But although Del Monte's systems

facility was shielded from the explosion's ill effects, headquarters employees were forced to vacate their offices while public health workers scoured the premises for evidence of contamination, none of which was ever found, Holmes said.

By May 17, health officials had finally satisfied themselves that Del Monte's DP staffers could safely return to their corporate computer room. Before leaving the area again eight hours later, the employees completed the company payroll and did several other batch applications. After a one-day absence, during which health authorities tested further for contamination, the systems personnel reoccupied the computer room on May 19 and did another 16 hour's worth of processing. By week's end, the company found itself back on schedule with its key batch processing applications.

Holmes attributes his firm's relatively swift recovery in part to Del Monte's acquisition of a new IBM 3083, the arrival of which preceded the mid-May explosion by only two weeks. Because it operates twice as fast as the IBM 3031 it replaced, the

Timetable for Disaster

Sunday, May 15, 10 a.m. — An explosion in a power transformer wracks the basement of Del Monte Corp.'s headquarters building and produces a fire that spreads to the transformer's coolant, polychlorinated biphenyl (PCB). A cloud of carcinogenic PCB fills the basement and leaks outside, but fails to reach other parts of the building, thanks to an automatic shutdown of the structure's air circulation system.

The fire burns undetected and soon triggers a power outage. Error messages appear on Del Monte's systems console and are noticed by an operator, the only member of the 150-employee DP staff on duty at the time. Within a few seconds of the electricity failure, the company's IBM 3083 mainframe switches to auxiliary power.

After observing smoke in a stairwell, the operator calls the building's control desk supervisor, who orders her to evacuate immediately. The operator hurriedly stores her employer's critical magnetic tapes in a security vault and flees before she has a chance to turn off the system's auxiliary power.

11 a.m. — City fire fighters have arrived on the scene and are well on their way toward extinguishing the blaze in the building's basement.

Monday, May 16 — Local public health authorities permit Del Monte's DP staff to return to the computing room long enough to shut down the facility's auxiliary

power. The employees are then required to leave the building immediately. For the whole day, Del Monte is unable to conduct ordinary business.

Tuesday, May 17 — DP employees are again admitted to the headquarters, where they run the company payroll, which is usually processed on Mondays. Eight hours and several other batch applications later, the workers are ordered to leave.

Wednesday, May 18 — The building at One Market Plaza is again closed to all DP personnel while health officials and cleanup crews check the computing department for signs of PCB contamination.

Thursday, May 19 — After the machine room gets a clean bill of health, systems employees report to work and stay for 16 hours before the local health department asks them to vacate the premises.

Saturday and Sunday, May 21-22 — Sales orders that were supposed to have been processed on Friday, May 20, are completed during the weekend instead. At this point, the company's batch processing operations return to normal.

Wednesday, May 25 — Del Monte's DP support area, which houses the firm's data entry department, is reoccupied for the first time since the disaster. For 10 days, concerns about possible PCB contamination had prompted health officials to declare the support area off limits to Del Monte's employees.

3083 rapidly eliminated the company's sudden backlog of unfinished batch applications.

When the May 15 explosion produced the large quantities of toxic PCB, local public health officials were at first reluctant to allow the company's data entry operators to return to their work areas. Not until 10 days after the explosion did data entry personnel finally return to work,

Holmes said.

Many other sections of the building, however, remain off limits and appear unlikely to be reopened soon. Because many of Del Monte's employees have been unable to return to their work areas and reclaim their terminals and other equipment, the corporation has been forced to acquire large quantities of replacement hardware.

Express DSS Linked With '1-2-3' for IBM Micro

By Paul Gillin
CW Staff

WALTHAM, Mass. — Management Decision Systems, Inc. last week cleared a path for the integration of IBM Personal Computers into a network centered on its Express information analysis and modeling software. The company announced it will become a value-added reseller for Lotus Development Corp.'s 1-2-3, a Personal Computer-based spreadsheet, data base management and graphics package.

Management Decision Systems also announced Express-Link and Express-Mate, two packages that it said link more closely software running on the Personal Computer with the

Express data base. The company also released a version of Express for the Prime Computer, Inc. Prime 2250 minicomputers and another for marketing applications.

Called 1-2-3 Express, the integrated package will allow access from the Personal Computer to Express data and analysis tools, the company said. Enhancements to 1-2-3 include:

- A communications facility for automatically logging into Express and exchanging data.

- A host computer data base providing tools to assemble 1-2-3 work sheets, including labels, text, models and data.

- Audit mechanisms that allow administrators to monitor which users have accessed which version of

the data.

- Data extraction capabilities to transform Express output to 1-2-3 work sheets.

- The 1-2-3 macro language extensions that add series of menus for performing Express-like tasks.

- A support and training program for the integrated packages.

The cost of 1-2-3 Express is \$945 per package. Current users of 1-2-3 can buy the enhancements for \$450.

Express-Link is a Personal Computer package that automatically reformats data to enable Express to communicate with a variety of microcomputer programs, including 1-2-3; Visicorp's Visicalc; Software Products Co.'s Procalc; Micropro International Corp.'s Wordstar; Addi-

son-Wesley Publishing Co.'s Micro-DSS/Finance; and Data Resources, Inc.'s Visilink. Express-Link can be used to retrieve a two-dimensional slice of information from an Express data base by answering prompts, the company claimed.

Express-Mate is a communications product that lets the Personal Computer function as an Express workstation. Features include automatic login; scrolling up to four pages; recall of previous input commands; local editing; file transmission and reception; and color graphics support.

Express-Link and Express-Mate each costs \$250 with the two available as a package for \$450 from Management Decision Systems, 200 Fifth Ave., Waltham, Mass. 02254.

DSS-DP Clash Worrying Users

(Continued from Page 1)

said. "Communications basically break down in management. They're not understanding what we're doing and we're not talking to them."

Martin Karl, a senior financial research analyst at Boston Edison Co. in Boston, cited "the politics of interplay between DP and the user community" as a major issue of concern. "The unwillingness of DP to let micros be used is a barrier to implementing an effective DSS," he said, but he had been reassured to find "that others have had some of the same problems."

Most attendees were curious to find out what is new in DSS technology. "We have an existing DSS and we're looking to refine it," said J.N. Kotanchik, a senior economic specialist in the Products Economics Division of Shell Oil Co. "We're looking for a fully integrated system and compatibility with minis and micros. A lot of thought is going into [our DSS]. The question is how to translate that into action," he said.

Charles Boyle, information manager in the supplies division of Wang Laboratories, Inc., was looking for "good ideas about how to bridge the gap between the users and the hard facts and administration of some of these systems." Boyle was particularly concerned with controlling data bases so that information is not duplicated.

Booklet Analyzes Accounting Tools

ROCKVILLE, Md. — Computer Training Services has announced "Introduction to Microcomputer Accounting Systems," which analyzes selected financial and accounting packages from Peachtree Software, Inc., Open Systems, Inc., BPI Systems and IUS.

The booklet includes a narrative and comparative matrix, which covers all data elements of the master files, all transaction components, audit trails and reports. Sheldon Needle, president of Computer Training Services, installed each system and operated all menu functions.

The booklet is available for \$35 from Computer Training Services, 5900 Tudor Lane, Rockville, Md. 20852.



- BDS/Dataproducts Plug-Compatible Printers
- Built for Handling Continuous High-Volume Output

IBM · DEC · HP BURROUGHS

- Since 1975, the Largest Independent Supplier of Plug-Compatible Printer Systems
- Over 5,000 Systems Installed
- Complete Line of High Quality Daisy Wheel, Matrix and Band Printers. 55 CPS to 2000 LPM
- 30-50% Savings
- Quick Delivery (30 Days or Less)
- Reliability Built-In (BDS Controllers and Interfaces)
- Low Maintenance Cost
- TRW Nationwide Service
- Price Includes Installation and 90 Days Parts and Labor Warranty

I would like more information on plug-compatible printers

- ☐ 55 CPS Daisy Wheel Printer

- ☐ 80-300 CPS Matrix Printer
☐ 300-2000 LPM Band Printers

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone (_____) _____



(415) 326-2115

BDS Corporation
1120 Crane Street
Menlo Park, CA 94025

U.K. (734) 730025 Australia (03) 241-8901

American Bell Unveils Videotex Terminal...

By Phil Hirsch

CW Washington Bureau

NEW YORK — American Bell, Inc. unveiled AT&T's long-awaited videotex terminal here last week at the Videotex '83 conference. The Sceptre will go on sale for \$600 in the Miami area next September, when the telephone company and Knight-Ridder Newspapers, Inc. are scheduled to begin a residential videotex service called Viewtron.

Numerous hints about follow-up products to Sceptre were dropped during American Bell's presentation. One possibility — a personal computer capability.

"Personal computers and videotex are converging," said Project Manager Carolyn Chin. "We are looking at the options." Other possibilities include lower prices as a result of declining chip costs and a terminal that can access only alphamosaic graphics. The present terminal also accommodates alphegeometrics, which raises its cost.

Sceptre Follow-Up

The middle of next year would be a good time to look for the first follow-up to the initial Sceptre offering, another American Bell official said.

Last week's unveiling of Sceptre included a decoder and wireless key pad. The latter, which communicates with the former via infrared signals, includes a 42-button Qwerty keyboard, 10 command keys, eight host-programmable function keys, one-button access to a maximum of 15 stored telephone numbers and automatic last-number redial capability.

The decoder includes a 1,200 bit/sec synchronous/asynchronous modem plus ports for an extension phone and printer.

Sceptre accesses the telephone network through Local-Area Data Transport, a scheme allowing digital data and analog voice to be transmitted simultaneously on a conventional analog local loop. If the viewer receives a telephone call while watching the display, a message appears on the screen. If the viewer has an extension phone, he can answer it without leaving his television set.

The new terminal supports the North American Presentation Level Protocol Syntax (NAPLPS), the graphics display standard AT&T is proposing as a U.S. and world videotex standard. NAPLPS is compatible with Canadian and French videotex formatting schemes but not with that

CW at Videotex '83

of the British.

Sceptre also supports the Data Encryption Standard developed by IBM and the National Bureau of Standards.

The display supports a palette of 512 colors, 16 of which can be displayed simultaneously. The screen provides a resolution of 256 pixels by 200 raster scan lines.

... But Software Could Make It Obsolete

By Phil Hirsch

CW Washington Bureau

NEW YORK — A few hours after American Bell, Inc.'s Sceptre videotex terminal was unveiled here last week at the Videotex '83 conference, a Canadian company announced a software package that appears to make the terminal obsolete.

The two product announcements reflect in dramatic fashion how the prices of videotex components are dropping, making it likely that the mass market which videotex promoters have been promising for years is finally about to materialize.

The software announced last week by the Avcor Division of Southam Communications Ltd., a major Canadian videotex vendor, converts a Commodore Business Machines, Inc. Commodore 64 personal computer into a North American Presentation Level Protocol Syntax (NAPLPS) decoder. Priced at \$100 and available in 45 days, the software will be stored on disks and cassettes, said Avcor Vice-President Zal Press.

Avcor, headquartered at 512 King E., Toronto, Canada, is currently negotiating with a number of data base services — Compuserve and The Source were among those he specifically mentioned — to download the software, Press added.

Based on the prices quoted by Press, a videotex user could implement the whole system — even if he had to buy the Commodore 64 — for less than the price of AT&T's new terminal; moreover, he would also end up with a personal computer.

A package that converts the IBM Personal Computer into a NAPLPS decoder will be available from Avcor in about 90 days; by the end of the

Sceptre terminals will be marketed through American Bell Phone Centers and selected retail establishments, American Bell said. A massive advertising campaign that includes public demonstrations in shopping centers and schools will be launched in September.

American Bell said the terminal's initial price of \$600 will be raised to \$900, but it did not say when. The cost to American Bell of manufacturing the terminal has been widely reported to be at least \$1,000.

According to Clarence Selin, American Bell's director of consumer

information services, the market for the terminal is mostly residential but includes work-at-home and some business applications. He estimated the total prospective Sceptre residential market in the Miami area at roughly 200,000 households.

American Bell clearly hopes its collaboration with Knight-Ridder will create new markets. Besides Miami, Knight-Ridder publishes newspapers in several other cities and has announced plans to establish Viewtron services in many of them. It has also interested other publishers in establishing Viewtron-like systems.

year, packages for the other leading personal computers will be available, promised Avcor President Robert Baum. Roughly 5 million personal computers are now installed in the U.S., he noted.

Videotex Costs Nose-Diving

A Videotex '83 session entitled "On the Cutting Edge" provided more evidence that technology is causing videotex system costs to nose-dive. Vendor representatives at that session discussed new products that their companies introduced last week at Videotex '83:

- A Videotex Office and Information System based on the Radio Shack TRS-80 Model 16B microcomputer and designed for both private and public applications was announced by Tandy Corp. The latter include providing dispersed company locations access to inventory, accounting and similar in-house data bases. The user terminal is a personal computer. Costs reportedly range from \$13,500 for a 200-user system to \$60,000 for a 12,500-user system, from Tandy at 1700 One Tandy Center, Fort Worth, Texas. 76102

- Quazon Corp. announced that Horizon Bancorp, a New Jersey-based bank holding company, will begin a home banking service in September based on Quazon's Custom Quik-Link terminal. Each terminal costs "less than \$199," said Marketing Vice-President James Lokey. Earlier, Quazon won a contract from Travelhost, Inc. to supply 500,000 copies of a similar terminal over the next three years. The first ones were recently installed in Chicago's Midland Hotel, where they are being used by guests to access a variety of data base services [CW, June 6]. Quazon is headquartered at 3330 Keller Springs Road, Carrollton, Texas 75006.

- Telelogic discussed its new Tex decoder, which interfaces Prestel videotex terminals to telephone circuits. It costs \$100 — reportedly one-third the price of current Prestel decoders in the U.S. Telelogic is selling the decoder for \$100 because it uses the telephone key pad in place of a keyboard, and there is no modem. The modem is replaced by existing circuitry within the telephone plus a simple demodulator. Telelogic is located at 196 Broadway, Cambridge, Mass. 02139.

Tex was invented by Stuart Lipoff, an electronics expert and market researcher at Arthur D. Little, Inc. Li-

poff said at the conference that the decoder is cheap enough to be given away by videotex system operators.

A printer peripheral is reportedly due in December. It will also be priced at about \$100.

- Circuit boards from Wolfdata, Inc., reportedly convert IBM Personal Computers into Prestel and/or NAPLPS decoders. Prices range upward from \$495 from the firm located at 187 Billerica Road, Chelmsford, Mass. 01824.

- A videotex system from The Shuttle Corp. features a 17-key user terminal priced at \$175; a 56-key version costs \$250. The Shuttle, located at 2565 152nd Ave. N.E., Redmond, Wash. 98052, also markets, via satellite, a videotex information service priced at \$5/mo and \$3 to \$4/hour of connect time.

- A company associated with Shuttle Corp., Microperipheral Corp. (same address), announced a receive-only modem, retailing for "less than \$70." It allows software to be downloaded to a personal computer using commercial radio frequencies, together with a conventional radio at the user's end of the transmission path.

AMS Releases Report on OA

WILLOW GROVE, Pa. — A report that incorporates surveys of over 4,000 managers, experts and employees to provide information and recommendations for managing human resources in the office of the future has been released by the Administrative Management Society (AMS).

The report, "The Office Revolution: Strategies for Managing Tomorrow's Work Force," reveals that managers and employees have very different views toward the automated office. Managers are more concerned with justifying and implementing automation, whereas employees focus on the people/automation relationship, a spokesman said.

The study also outlines 49 potential problems of implementing automation and recommends solutions, the spokesman said.

The report costs \$14.95 for non-members, \$10.75 for AMS members, from the AMS Foundation, 2360 Maryland Road, Willow Grove, Pa. 19090.

FusiCalc™ On IBM/36?

Call for details about FUSION 3, 'Electronic Worksheet' and Financial Modelling System.

FUSION
PRODUCTS INTERNATIONAL

(415) 381-1340
PO Box Fusion
Mill Valley, CA 94942
Telex 176099 FUSION

IBM Micro Security



DiskLocker • Data Encryption
Unit Locking • Software Protection

MPPI Ltd., 1120 Adirondack, Northbrook, IL 60062
Telephone 312/480-9730

IBM is a registered trademark of IBM Corp.

Multimillion-Dollar Network Credited Results of World Games Out in Record Time

By Ed Scannell
CW Staff

EDMONTON, Alta. — No more than four seconds after the completion of the 100-meter swimming final at the 1983 World University Games, spectators watching the track and field events at Commonwealth Stadium five miles away will know who won.

That is what five man-years of software development and \$2.1 million get you — instant results.

As an international sporting event, the University Games now taking place here are second only to the Summer Olympics in size. The various competitions, open to university athletes between the ages of 17 and 28, are expected to attract 700,000 people over 10 days. But the sheer size of the games means that individual events will take place at 19 different locations here.

Tying together this athletic three-ring circus is a multimillion-dollar computerized results network that will compile and distribute to all other locations the results of each event within seconds after its completion. The network was designed and installed by Digital Equipment of Canada, Ltd. and is based around two VAX-11/780 superminicomputers connected via telephone lines to 50 VT100 terminals and 30 LA120 printer/terminals located in 19 venues across the city.

The network is similar to the one DEC put together for the 1978 Commonwealth Games, also held here. But like the athletes whose performances it will be recording, this latest version of the network is faster and more flexible than the one used five years ago.

Sophisticated Version

Deborah Johnston, a spokeswoman for DEC Canada, used the swimming competition as an example of how much more sophisticated the second version of the system is compared with the first. The first version of the system, which was connected to an Omega clock timing the events, would record swimmers' times from when they left the starting block until they touched the electronic touchpad. "But with the second version, we have written an interface so that not only does the clock start and stop when a swimmer starts and finishes, but their times will be sent straight to the computer.

"What this means is that four seconds after a competition has been completed, spectators can find out who won or lost and what their times were anyplace there is a terminal."

Besides being sent to the other 18 venues, the swimming results will also be sent directly to the Commonwealth Stadium's scoreboard, the wire services, broadcasters' booths and to terminals located in the "athletes' village" and the print shop. From the information it receives, the shop will be able to print the previous day's results in its daily newspaper and venue programs, a DEC Canada spokesman said.

But not all results can be entered into the computer and distributed automatically, noted Larry Samoil,

manager of technical services for the games. Some results, like those from track and field, have to be put into the system manually.

"As track competitors cross the finishing line, a camera is used to record their times. The film is taken from the camera, developed in something like 20 seconds and put in a viewer where officials can then read the times. While that is being done, we have an input terminal in the timing room where that information is entered.

"However, the timing room is located some 500 or 600 feet away from the scoreboard operations, and it is not easily accessible," he explained.

But even when things have to be entered manually, results can be shown on the local venue's scoreboard and on the scoreboards of the other 18 venues in four to six minutes, Johnston noted. "Certainly, you should be able to get the results in 10 minutes, and that is assuming someone is a slow typist or maybe the runner bringing the result over tripped along the way," she quipped.

One Solution

Samoil said one solution for recording the track and field results faster is to send the information from the timing room to the scoreboard room over telephone wires, but that

method is "too prone to error."

Along with recording and distributing results, the network also has an inquiry mode that enables users to call up information on schedules, event start lists, personal information on athletes, country information, world records and historical data on the games.

DEC Canada said over 170 terminal operators will work a total of 900 individual shifts and are expected to handle 30,000 individual entries and inquiries during the 10 days. Operators with very little computer experience will be able to use the system because of its hierarchical system of menus.

Due to popular demand, we've created a new display that fits both tight spaces and tight budgets.

Our new ITT Courier 1700.

The 1700 is compatible with the 3278 model 2. Yet its footprint is only 13 x 12 inches (24% smaller than IBM's 3178). And its keyboard is only 16 inches wide (17.9% smaller than the 3178).

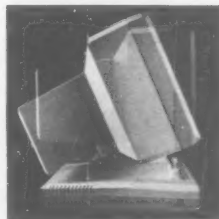
Still, the 1700 is big on

ergonomics and the kind of performance features you expect from ITT.

Its screen tilts and swivels, and its keyboard adjusts for optimum operator comfort.

It has Reveal to aid program development. Capture to aid troubleshooting. And Variable Field Underline to increase productivity.

Things you don't get with the IBM 3178.



ITT 1700 tilts, swivels and has a smaller price than IBM 3178.

Even with all this, the ITT 1700 is priced lower than IBM's 3178.

The ITT Courier 1700. The economy-sized 3270 display that really is economical. 1-800-528-1400 Ext. 7796 Sales Support Department ITT Courier Headquarters Marketing, 1515 W. 14th Street, Tempe, Arizona 85281

ITT Courier

WE HAVE 3270 COMPATIBILITY IN THE NEW ECONOMY SIZE.



ITT Courier 1700.

Terminals, Peripherals Debut at Graphics Meet

By Jim Bartimo
CW Staff

CHICAGO — Terminals and peripherals topped the list of products unwrapped here last week at the National Computer Graphics Association's annual meeting (NCGA '83). Notably lacking was any great number of major software announcements.

Tektronix, Inc. offered both a family of color graphics terminals and a programmable CPU that will give those terminals stand-alone capability.

The 4100 series of color graphics terminals was designed for data analysis, presentation graphics, computer programming and text editing. It supports Ansi standards for text editing in the dialog area and will execute most Digital Equipment Corp. VT100 terminal programs, Tektronix claimed.

The Models 4105 and 4107 are color raster-scan displays with 13-in. screens that sell for \$3,995 and \$6,950, respectively. The Model 4109 features a 19-in. display for \$9,950.

The 4170 Local Graphics Processing Unit will convert any of these new terminals into a stand-alone processor running Digital Research, Inc.'s CP/M 86 operating system. The processor is available for \$5,500 from Tektronix, P.O. Box 1700, Beaverton, Ore. 97077.

Connecticut Committee to Study CRT Safety Issues at Home, Work

HARTFORD, Conn. — Connecticut has become the second state to authorize a study of CRT safety issues, this time in the home and workplace.

Following Maine's recent statutory resolve ordering a two-year study of state and public CRT-related jobs [CW, June 27], Connecticut Gov. William O'Neill recently signed into law S. 811, which calls for the Department of Consumer Protection to report on its findings by Feb. 23, 1984.

With the assistance of its Product Safety Division and the Connecticut Academy of Science and Engineering, the Department of Consumer Protection must address the following questions:

CW at NCGA '83

Ramtek Corp. unveiled a thermal printer said to produce hard copy on color paper or overhead transparencies in less than 60 seconds. The 4111 Colorgraphics Printer reportedly produces a duplicate of the CRT screen by using a subtractive color transfer process.

The thermal printer is available for \$6,500 from Ramtek at 2211 Law-

son Lane, Santa Clara, Calif. 95050.

Major Vendors Include Prime, CDC Product Offerings Target CAD/CAM Mart

CHICAGO — Prime Computer, Inc. and Control Data Corp. were but two major vendors introducing products for the computer-aided design and manufacturing (CAD/CAM) market at National Computer Graphics Association's NCGA '83 here last week.

Prime added another unit to its Prime Workstation 200 series of intelligent workstations. The PW200T, designed for remote communications, features a 32-bit processor, interactive devices and dedicated modules of Prime's Medusa two- and

three-dimensional CAD package.

The workstation also includes a dedicated module of Primenet software and a communications interface. This is said to allow synchronous, remote communications over leased line or via public data nets.

The workstation is available in a number of configurations ranging in price from \$66,000 to \$106,000. Prime is home-based at Prime Park, Natick, Mass. 01760.

CDC brought out a CAD and drafting system to be hooked up through its Cybernet data services network or directly to a Cyber 170 mainframe. Included with the system are CDC's Icem/120-40 desktop

workstation, CD/2000 software and the Advanced Operating System, a CDC spokesman said.

The CAD system is available for approximately \$50,000. More details are available from CDC, Box O, Minneapolis, Minn. 55440.

Applicon, Inc. introduced a CAD/CAM system based on the Digital Equipment Corp. VAX-11 supermini. Bravo includes a menu-driven user interface, a data base management system, an Applicon programming language and application packages. Prices for the fully configured Bravo system begin at \$120,000. Applicon is located at 32 Second Ave., Burlington, Mass. 01803.

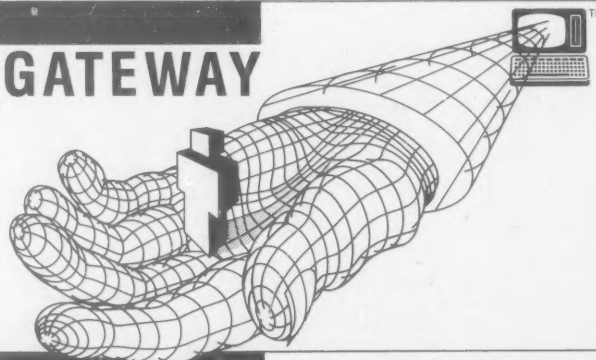
- Whether there is any ocular pathology associated with the use of video display equipment.

- Whether there is any visual or musculoskeletal fatigue associated with such equipment.

- Whether ionizing or nonionizing radiation is emitted by CRTs and how the levels of any such emissions compare with normal background radiation, other common sources of radiation and standards promulgated by the U.S. Department of Health and Human Services.

In undertaking the study, the committee is required to review and evaluate the scientific technical literature on the subject and assess "the breadth, depth, content and scientific rigor of prior studies."

GATEWAY



Meeting the Challenge of User Friendliness

Let Gateway harness the power of the Information Center for your end users.

- An environment for VM/SP that protects users from the complexity of commands and product languages.
- Easily tailored menus to support the Information Center and Decision Support environments, adapting to the user's level of sophistication.
- Easy to use, full screen prompters today for FOCUS, RAMIS II, Tell-a-graph & SAS/GRAPH.

Please send more information:

Software Corporation
of America Inc.
353 Lexington Avenue
New York, NY 10016
212 532-2990

Name _____
Title _____
Company _____
Address _____
Phone _____



AVOID DOWNTIME!

WATER ALERT®

... FOR COMPUTER AREAS

Warns you of water leakage in sub-floor wiring systems.

- Produces a loud, intermittent alarm when activated by presence of water.
- Completely self-contained...no wiring, no connections.
- Early water detection (1/64" water film activates alarm) provides maximum time for corrective action.
- 24 hour per day monitoring.
- Options include remote indicator, remote flashing light, and automatic telephone dialer.

8 Models from \$59 - \$110
Call or write for complete information.

Division of Electro-Consultants, Inc.
7424 W. Layton Ave., Milwaukee, WI 53220
Phone 414 282 4840

Dorlen Products

CAD/CAM Hot Topic For Show Attendees

By Jim Bartimo
CW Staff

CHICAGO — While the subject of business graphics dominated the well-attended technical sessions here last week at the National Computer Graphics Association's NCGA '83 show, opinions offered by people on the exhibit floor suggested a different focus.

A random sampling of 10 vendors, users and analysts at NCGA '83 found that graphics, although attractive to the business user, is still very much the domain of engineers and designers. Computer-aided design and manufacturing (CAD/CAM) is still the hot area.

Moreover, while some microcomputer graphics vendors reported good business, the show's exhibit floor was not dominated by end users and DP managers.

Graphics Pros Attracted

"The show appears to be attracting graphics professionals more than the MIS [management information systems] manager," said industry analyst Neil Kleinman of International Data Corp.'s Pacific Technology Center in Santa Monica, Calif., suggesting that "it's a show that integrates many things, and perhaps some of the MIS gets lost in it."

Like most attendees, "I'm here to see what's new in CAD/CAM," said a programmer employed by HPM Corp., an Ohio-based injection molding machine manufacturer. "There's a lot of it here."

One computer support service manager was found eyeing the business software at Digital Equipment Corp.'s booth. "We're about to launch into office automation in the research and development environment," said Gus Mercurio of the Akron, Ohio-based Goodyear Tire and Rubber Co. "Graphics is going to be an area of interest, and we're starting to support micros. Our long-range plan is to use personal computers as terminals and get the best of the mainframe, too."

Another DP manager was found lingering around some output devices, but he was shopping for CAD/CAM. "Right now, we have an entry-level graphics system, but I'm looking to see what's new in CAD/CAM," said Jerry Dusinski, DP manager at Triangle Package Co., a Chicago package machinery manufacturer.

Despite the lack of MIS executives at the show, some microcomputer peripheral manufacturers, such as Sof-

CW at NCGA '83

tel, Inc. of New York, reported much interest in its business software and hardware add-ons that bring higher resolution graphics to some micros.

Small Firms Using More Graphics

CHICAGO — Business graphics, once reserved for large companies with mainframe computers, are being used increasingly by smaller companies with microcomputers.

That was one of the conclusions in a study recently conducted by International Data Corp. (IDC) and reviewed here last week at the National Computer Graphics Association's NCGA '83.

The research firm's study of 200 users also found that:

- Most graphics are used for manage-

ment presentations (94%) or for planning and forecasting (90%).

- While 97% of graphics are traditional bar, pie and line charts, other applications such as organizational charts (66%) and logos and illustrations (64%) are also popular.

- Sixty percent of all graphics are produced on paper and 18% are produced on CRT screens.

- Productivity has increased among 94% of the respondents, and the demand for graphics has risen as a result.

3270 Users...

Get 3278 Features for less than 3178 Prices.

...from PHAZE

A superior value

IBM announced its 3178 on March 8, 1983. The PHAZE P3278 has been available since November 8, 1982. Our lower cost, more functional 3278/3178 alternative is available now. And, at \$1545, our coax plug-compatible P3278 will be the star of your add-on and replacement program. That's because PHAZE makes the addition easy. More importantly, you'll get a host of special features not found on theirs. That makes PHAZE a good buy, and a superior value.

Easy to use
The compact, modular P3278 can be installed in less than 60 seconds. Without heavy lifting. Without tools. Easy installation reflects the human engineering features of the unit. Features like an easy-on-the-eyes, non-glare screen that tilts and swivels with fingertip command. A thin movable keyboard, with a continuously adjustable angle through the optimum range. And PHAZE meets the tough European human factors requirements.

Extras that don't cost extra
Standard features include an 87-key typewriter keyboard with 24 program function keys, a 12-key numeric keypad, automatic video shutdown, combination security locks, a numeric lock and an audible alarm. The only option to buy is a light pen.

Satisfaction guaranteed
PHAZE makes your purchasing decision risk-free. In addition to our standard 90-day warranty, we offer a 30-day money back guarantee if you're not completely satisfied with our product.

Terrific price. An unusual range of features. Money-back guarantee. And liberal quantity discounts. PHAZE will make you a purchasing legend in your own time. Call us today to place your order or to obtain more information. Ask for H. P. Watson at (602) 991-6855.

PHAZE
INFORMATION MACHINES CORPORATION

We make the addition easy
PHAZE Information Machines Corporation
7650 East Redfield Road
Scottsdale, Arizona 85260

PHAZE is a registered trademark of PHAZE Information Machines Corporation.

International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

AUSTRALIA

SYDNEY — The Teletel videotex system from France's Intelmatique was chosen over the British Prestel system to serve the travel industry here. The multimillion-dollar Australian Federation of Travel Agents contract will result in a videotex service called Afel, providing access to airline schedules, tour information, hotel reservations and car rental information. Computer Accounting Services Pty. Ltd., a major Australian time-sharing bureau, will run the videotex software on Honeywell, Inc. DPS 6 minicomputers. The videotex service will begin operating in October; a network of 800 Minitel (French stand-alone terminals) are slated to be installed in the first 20 months.

GREENWICH — Armed with new venture capital funds, Apollo Computer Equipment Pty. Ltd. announced it will set up manufacturing operations in St. Paul, Minn. The company produces interfaces that allow different printers to be attached to IBM System/34 and System/38 computers.

SYDNEY — Qantas Airways Ltd. is increasing its computing power with the addition of two Amdahl Corp. 550-5850 mainframes. The two machines will replace two Amdahl 470V/6s, according to Alan Bullot, Qantas' manager of computer and communications planning.

DENMARK

COPENHAGEN — Because of a severe lack of experienced DP workers here and increasing unemployment among lower level programmers, Denmark's two DP unions (Prosa and Samdata) have started actively campaigning for new jobs in smaller companies. Meanwhile, Christian Røvsing A/S, Denmark's largest DP employer, has asked for government help in recruiting 100 experienced DP people from other countries.

COPENHAGEN — Ejler Ottesen, a

Danish systems programmer, has introduced a data base management system that is "sort of a fourth-generation language." The International Data Base System has been well-received, according to industry sources.

FRANCE

GRENOBLE — Symag, a small microcomputer manufacturer, has introduced a personal computer based on Intel Corp.'s IAPX 186 microprocessor. Called Orchidee, the system will run Digital Research, Inc.'s CP/M-based software programs with a Zilog, Inc. Z80 microprocessor and Digital Research's CP/M 86 software and Microsoft, Inc. MS-DOS software with the Intel microprocessor, according to a spokesman for the vendor. The 16-bit version of Orchidee, with 256K bytes of random-access memory and two diskettes, is priced at \$6,500, a spokesman for the vendor said. In a related announcement, the spokesman for Symag said it has reached a technology-transfer agreement with the Republic of Madagascar's Intergovernmental Bureau of Informatics.

PARIS — "We will deliver our first PBX [private branch exchange] systems to the market by July 1, 1984," stated Raymond Jacobson, chairman of Anderson Jacobson, Inc., at a recent press conference here. According to Jacobson, Anderson Jacobson will introduce two PBXs, one aimed at installations calling for up to 250 lines and the other for applications dealing with 250 to 1,000 lines.

BRAZIL

SAO PAULO — More than 4,000 technical people and computer industry experts are expected to attend Informatica '83, Brazil's largest official national computer fair, scheduled to take place here Oct. 17-23. The annual event, which is sponsored by the Brazilian government, will feature equipment from data processing, communications, telecommunications, graphics and office automation equipment vendors.

Conference headquarters are located at Sucusu Sao Paulo, Av. Paulista, 1159 - 14 andar, cj. 1404, 01311, Sao Paulo, SP, Brazil.

JAPAN

TOKYO — Two American companies with their own versions of the Basic language are in competition here in response to the Japanese personal computer vendors' movement to adopt an industry standard version of Basic. Microsoft, Inc. has recommended its MSX-Basic, and Digital Research, Inc. plans to introduce another version of Basic as an alternative in the near future.

TOKYO — Sofmap, one of the leading companies in the market for renting personal computer software, is being sued by eight software vendors here for infringement of their copyrights. The vendors are suing to prohibit rental shops from lending their software products to individuals who copy the software for their own use.

TOKYO — Y.E. Data, Inc. plans to increase by more than double its floppy disk drive production in response to heavy demands for its product line.

TOKYO — Hitachi Ltd. announced that its net income increased 10% and its sales rose 7% in the fiscal year ending March 31. Net income rose from \$571 million to \$627 million, while sales jumped from \$15.35 billion to \$16.43 billion, a company spokesman said.

NAGOYA — Mitsubishi Electric Corp. recently established Mitsubishi Electric Mechatronics Software Corp. The new company will develop

and manufacture software for control equipment for mechatronics products, such as robots and other factory automation devices.

UNITED KINGDOM

BERKSHIRE — A survey of IBM mainframe sites in the UK has shown that application software, which takes companies roughly 10 months to develop and costs about \$800,000, is replaced, rewritten or simply thrown out every year at each installation because it is considered obsolete. Furthermore, 20% of the sites regularly discard work that takes longer than one year to replace. The survey, called "Application Development in Practice," was conducted by Xephon Technology Transfer Ltd. of Berkshire.

WEST GERMANY

MUNICH — The relationship between IBM and its Share European Association users group has begun deteriorating after IBM announced its new policy to restrict source code. While IBM argued that the restrictions are intended to protect the software from plagiarism, German users felt the move was aimed at making non-IBM products harder to use and, therefore, less attractive.

FRANKFURT — Control Data Corp. recently won back Siemens AG as an OEM partner.

COLOGNE — The First European/U.S. Microcomputer Show took place here June 23-26 and featured microcomputers for businesses, home users and hobbyists. The fair was cosponsored by the U.S. Embassy and the German conference company, Koeln Messe.

Overworked? Get these DOS/VS(E) and CICS/VS labor savers!

Our program products help your systems people do more work with less effort, at a cost that's surprisingly lower than comparative methods. Use them alone or in combination.

BIMSPPOOL retrieves batch prints from POWER/VS queue and prints on 3270-type terminal printers.

BIMSPPOOL creates batch prints from CICS application programs.

BIM-ODIS determines CICS status and operational or performance problems.

BIMSUBMIT edits and submits jobs on-line.

BIMTEXT creates formatted documents from free-form input.

BIMCMPIRS compresses 3270 transmissions reducing response time.

New products are under development for release soon. We also offer experienced systems programming consultation nationwide, with bases in Minneapolis and Washington D.C.

All BIM products come with a 30-day free trial, so you can see just how much labor the programs really save — without any financial risk. Full documentation is also available on request.

BIM program products are already successfully at work in 12 countries. Phone or write us to find out how they can help you.

BIM

B I MOYLE ASSOCIATES, INC.
4355 Lyndale Ave. S., Minneapolis, MN 55409
612/922-2661 Telex 290 123
Member Independent Computer Consultants Association

DECsystem-10/20 Users...



Mainframe Modeling at a Micro Price

- BBL II+ is a true decision support language, not a spreadsheet package
- Self-documenting models that look and read like English
- Easy to learn and use, yet incredibly powerful
- Delivered with superior documentation — installs in minutes
- BBL II+ "Starter Kits" cost just \$95, including complete BBL II+ documentation, the BBL II+ application library and a 90-day trial copy of the BBL II+ system

If you own or use any standard DECsystem-10 or DECSYSTEM-20, you can finally get the mainframe modeling system you need, at a price you can afford... just \$2950! Prove it for yourself with a BBL II+ "Starter Kit". Call or write today for complete details.

BBL II+ Available Now... Just \$2950⁰⁰

DECsystem-10 & DECSYSTEM-20 are trademarks of Digital Equipment Corporation.

BBL II+

Core & Code, Inc.
3 Winding River Circle, Wellesley, MA 02181
(617) 237-4354

Software AG Users Group Juggles Question of Whether To Seek More Independence

By Lois Paul
CW Staff

NEW ORLEANS — The question of whether to seek more independence from its vendor arose during the recent annual conference here of Software AG of North America, Inc.'s international users group (Saggroup).

Although the jury is still out, the feeling among Saggroup's executive committee members is that the group will maintain its current relationship with Software AG, one that has worked well in most respects.

A motion was passed at the conference authorizing the executive committee to explore the possibility of separating the administration of Saggroup from Software AG. The issue central to the motion appears to be concern that a better means is needed to gather and maintain specific information about product users.

The users group currently relies on Software AG for information about users. When a member of the executive committee gets a call from one user trying to find other users with similar configurations and problems, he cannot always quickly refer the user to appropriate installations.

No Immediate Separation Seen

Despite this problem, Saggroup's President — Jennifer C. Lee, data base administration manager for Aerospace Corp. in El Segundo, Calif. — does not feel a separation of the users group from the vendor will take place "anywhere in the measurable future. On the whole," she added, "we have a very good relationship with Software AG."

While Lee admitted that "one thing we find lacking is a users group tool to contact other users and get hold of them quickly," she believes that accumulating and maintaining a list of all of Software AG's users would be too large a task for the users group itself.

Robert Galley feels there is no way Saggroup could operate without vendor involvement; the user base is not large enough, and there would not be enough financial backing. Galley, manager of systems support for Santa Fe Energy in Amarillo, Texas, serves as Saggroup's product representative for Software AG's Adabas data base management system. He coordinates the special interest group chairmen and tries to channel their needs and directives to Software AG through the executive committee.

Using Vendor Time, Resources

Saggroup, like other users groups affiliated with vendors, relies on a combination of the time and resources of the vendor itself and the executive committee members to handle administrative matters such as setting up meetings and distributing technical questionnaires.

The users group works with Software AG to determine the agenda for the annual conference. Because users felt that the seven concurrent ses-

sions held during last year's meeting in Las Vegas were excessive, the number of concurrent sessions was reduced to four this year.

The four sessions included a combination of user presentations, Software AG presentations and tutorials led by vendor representatives and intended as educational vehicles for the users.

The main focus of the users group has been to act as a vehicle for suggesting changes and enhancements, according to Bob Becker, data base/data communications administrator



Bob Becker



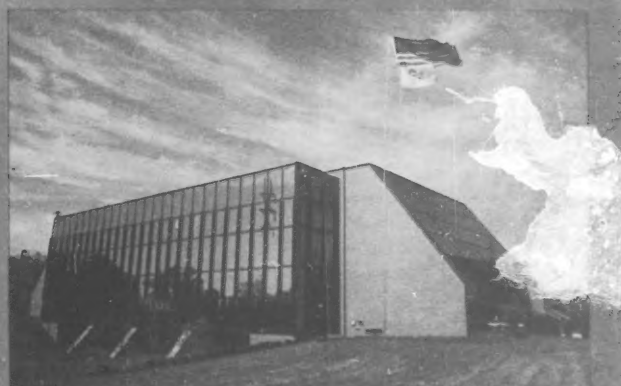
Jennifer C. Lee

for Foremost Insurance Co. of Grand Rapids, Mich., and currently technical support coordinator for Saggroup. One of the earliest users of

Adabas, Becker recalled the first conference he attended with about 25 other users. "Since 1973, the users

(Continued on Page 18)

Need IBM 4300 back-up?
When you're planning for disaster recovery,
plan on **HOTSITE**
the fully-equipped, dedicated facility



Fully equipped with an IBM 4341 Group II Computer, tapes, disks, CRT's and communication equipment, HOTSITE can put your computer operations back in business in a matter of hours.

If recent computer disasters haven't convinced you, your auditors probably have: a back-up facility is no longer an option. It's an absolute necessity. Your company is so dependent on the services of your computer center that, should your computers go down permanently — or even for an extended period of time, your business itself is in jeopardy.

And no back-up facility can serve your needs more thoroughly, more efficiently, more economically than HOTSITE, the fully-equipped IBM 4300 facility dedicated to disaster recovery. Centrally located in Niles, Ohio, HOTSITE has state-of-the-art hardware already in place and provides this unusual combination of benefits:

- Saves you money with flexible pricing
- Protects you with a state-of-the-art security system
- Supports your data communications network
- Assists you with technical support

This extraordinary package of services has been designed to

provide you with the greatest possible protection and flexibility at the lowest possible cost. For instance, our pricing policy allows you to pay only for the size of system you need and can afford.

Please use the coupon to find out more about HOTSITE, or call (216) 852-9624.



1000 Warren Avenue Niles, OH 44446

Complete and mail to: HOTSITE, 1000 Warren Avenue, Niles, OH 44446.

Yes, tell me more about HOTSITE, the fully-equipped IBM 4300 facility dedicated to disaster recovery!

☐ Please have a representative call. ☐ Please send a HOTSITE brochure.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

SALE
dition
eciate
st see

IAGER
ience
ssary
salary
tiabile
0770

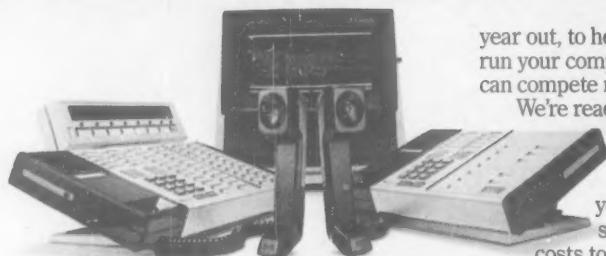
Call between 10/4 pie

INFORMATION
EXPE

SEEKS LO
RELATIO

CALL TOLL-FR

WANTED-F



American Bell Advanced Information Systems wants *you*. We're looking for a long-term, active partnership with you. We're not interested in selling you a system and then taking a walk.

Our goal is to live with you year in and

year out, to help you and your management run your company more efficiently. So you can compete more effectively and win.

We're ready to work with you and your staff before, during, and after we sell you anything.

Before the sale: We'll learn your business. Customize a system for you. Help you justify costs to your management. Give you systems that avoid obsolescence. Show you how to teach your users. And how to manage the system.

During installation: We'll coordinate the installation with you. Develop implementation plans. Test all equipment. And

make sure your cutover is smooth.

After installation: You'll have a single point of contact for repairs and maintenance. We'll also show you how to do your own maintenance.

In the future: Product applications and enhancements can be added as your business grows and you need a bigger system. Or as you need to add a message center, integrate voice and data, manage a network.

The American Bell Team that's ready to serve you

Not far from you is a new American Bell Advanced Information Systems office. It's one of 206 offices we've opened across



the country and staffed with 8000 sales and technical support people.

In our office nearest you are people we have already trained in the basics of your business.

The people already assigned to you are: An *Account Executive* trained in your industry, who will learn your specific business. A *Communications Systems Representative* with extensive technical training who will custom-design the system you need, including remote maintenance and self-maintenance. And begin to develop long-term plans for evolution without obsolescence. A *Customer Educator* who will train your staff in systems use and maintenance. And a

System Technician who knows your system inside out, so you will always have *one* contact for service and repairs.

Our credentials

We're the deregulated subsidiary of AT&T. We employ 19,000 people. Our Engineering, Design and Development group has 4000 remarkable people who come from world-renowned Bell Labs. They now work directly for American Bell.

We sell products made by Western Electric, famous for reliability.

We'll be able to design a system to fit you and the business you're in whether you're a mid-sized company that needs basic on-site

switching, or a vast conglomerate that needs an integrated voice and data system linking your offices in many locations.

We'll be calling you. Often. But it takes two to get a long-term relationship going. So feel free to call us. Anytime. Our toll-free number is 1-800-AIS-1212, Extension 880M.



American Bell
Advanced Information Systems

An AT&T Company

Users Group Role Requires Corporate Support

Being involved in a users group has its rewards, but it also requires a lot of time and effort as well as support from management.

While some companies may frown upon an employee's active role in a users group, The Aerospace Corp. of El Segundo, Calif., has encouraged its data base administration manager's participation in Software AG of North America, Inc.'s user group (Saggroup). Aerospace even paid last year for secretarial support for Jennifer C. Lee, current Saggroup president.

Despite her company's support for the active role she plays in Saggroup, Lee said that "your first loyalty has to be to the company that pays your salary. Somewhere along the line, your

time and energies become diluted. Something has to give."

Foremost Insurance Co. of Grand Rapids, Mich., has become accustomed to the involvement of Bob Becker, its data base/data communications administrator, since the firm was one of the first users of Software AG's Adabas data base management system. Becker's management feels that his participation in the users group is particularly beneficial in that it provides a means for the company to express its viewpoints directly to Software AG.

Robert Galley, manager of systems support for Santa Fe Energy in Amarillo, Texas, serves as Adabas product representative for Saggroup. "I think most management is aware of what

types of benefits involvement brings. In our case," he said, "it has helped provide exposure for my company and helped us develop contacts. We know who to call within Software AG and how to approach them."

The vice-president of Saggroup, G. Brett Aubrey, supervises data base services for Transcanada Pipelines in Calgary, Canada. Aubrey admitted that it is difficult for people to become heavily involved with a users group, particularly during tough economic times. However, he has not experienced problems; his firm recognizes that his users group involvement provides exposure in the DP field that he could not get at work and a broadened contact base.



Robert Galley



G. Brett Aubrey

"Hyatt was a pioneer of local area networks. When Datapoint introduced the first one, we ordered."

—Bob Regan
V.P. Management Information Systems
Hyatt Hotels Corporation



"Local area networks are the hot topic in data processing these days. But they're nothing new to us," says Hyatt's Bob Regan. "Ours have been up

and running for five years."

When Datapoint introduced the first local area network, the ARC® system, in 1977, Hyatt was among the first to install it. Today there are approximately 5,000 ARC local area networks in use, far more than any competing system.

"One reason the ARC network has been so effective for Hyatt is because it's easy to expand," says Regan. "Hyatt has had phenomenal growth, and the ARC has kept up. When more people needed the system to do more work, we simply added to the network."

The ARC local area network can be expanded virtually without limit by simply plugging in additional Datapoint processors, printers, storage disks, and terminals. Each new processor adds power to the

network so new users get the same fast response the original users were getting. Companies can closely match the power of an ARC system to their needs, expanding in small, inexpensive increments instead of buying "more computer than they need" in order to have room for growth.

What's more, Datapoint systems can be expanded or upgraded without replacing software. "We run some programs on ARC networks that were originally written for our first Datapoint computer more than ten years ago," says Regan. "That means we didn't lose any of the money we invested in programming and training. And it made the growth steps easy on our people. The changeover to the ARC network was accomplished in only two days."

No matter how far an ARC system is expanded, all the users can have access to all the data except where security precautions are installed. So even though more and more people are using more and more computers, there's never a

need to duplicate files.

"At present, Hyatt operates forty-five ARC systems," Regan says. "Others are in the planning stages right now. On the operations side we use them for accounting, reservations, and group sales. At Corporate we use them for accounting and for systems development. Obviously, we depend on them heavily. They're like the meters where we check our own financial performance. They simply have to work. And they do."

"Hyatt has stayed with the ARC system because it's been cost-effective. That's the bottom line. I can recommend a certain system to a hotel, but in the end, the system has to sell itself. And keep selling itself after it's installed. Our Datapoint ARC systems have done that."

For more about Datapoint, call (800) 531-5639. In Texas, call (800) 292-5099. Telex 767300 in the U.S.; 06986622 in Canada; or 923494 in Europe (UK). Or write Datapoint Corporation, Marketing Communications T41CW, 9725 Datapoint Drive, San Antonio, Texas 78284.



DATAPOINT

Saggroup Toys With Separation

(Continued from Page 15)

group has wanted to assert a voice in the direction of [its] products," he said.

The executive committee, which consists of three officers, three product representatives, several standing committees and a users group liaison, meets with Software AG twice a year. In between, there are "a lot of phone conversations and committee meetings," Becker explained. A recent effort to amend the Saggroup constitution was handled largely over the telephone, and the same is true for ongoing technical support.

Reason for Close Ties

Becker attributes the close ties between the executive committee and Software AG to the personal style of John Norris Maguire, the vendor's chairman of the board. "He has an attitude of being a very responsive person to his clients, and he has directed that into his organization over the past 10 years," Becker said.

Lee's perception is that the most valuable concept of users groups is the contacts they can make. For this reason, the executive committee set up a room with a bulletin board on which people could leave notes asking for the names of others with similar interests or problems.

Becker noted that the contacts with Software AG people are another benefit of involvement with the users group. "When I develop a rapport and a personal relationship, my service level will improve," Becker said.

Details History of Use at His Firm Ford Exec Sees Micros Taking 'Center Stage'

By Bob Johnson

CW New York Bureau
NEW YORK — "The consensus on the microcomputer in large organizations is changing — it is becoming the centerpiece of productivity."

That was how Mayford Roark, executive director of systems for Ford Motor Co., kicked off a talk on "Increasing

Corporate Productivity via the Personal Computer" at the recent Executive Microcomputer Conference and Exposition here.

Tracing the microcomputer through Ford's DP history to illustrate how its inception increased the company's productivity, Roark recalled that Ford's first experience with personal computers came through employees' hobbyists.

"We discovered from these hobbyists in the spring of 1981 that there were about 100 microcomputers in use at the company, and users were claiming that they actually increased their overall productivity," he explained.

At that time Ford had 8-bit Radio Shack TRS-80 Model II computers in its domestic operations and Apple Computer, Inc. Apple IIs overseas. The company was so pleased with the small machines' performance, especially their productivity benefits, that it decided in 1982 to purchase 500 additional microcomputers.

With the advent of the 16-bit machine, Ford seized the opportunity to boost its productivity level even more, according to Roark. Ford selected the Victor Business Products, Inc. Victor 9000, and over the first five months of implementation, purchased more than 500 of the machines as well as another 100 to give to employees for home use.

"All of the 16-bit machines we looked at were very good," Roark said. "We chose the Victor series for a

number of reasons, including price and support. Our main concern, however, was getting a microcomputer with mainframe [Microsoft, Inc.] MS-DOS data base communications capabilities, which the Victor had."

Ford is also a user of Digital Equipment Corp. Rainbow 100 computers for its national network of car dealers. It plans to install "several thousand" of these systems bundled with packaged software, Roark said.

The current tally of microcomputers at Ford is nearly 1,000, according to Roark. He maintained that the company is using them in many application areas with a variety of software in an effort to boost productivity. Ford is now using mostly spreadsheet-type packages such as Visicorp's Visicalc and Sorcim Corp.'s Supercalc.

One of Ford's more creative applications for the microcomputers is in its heavy truck pricing area, Roark noted. Because this application was such a "data base monster," with heavy volume and installation rates, Ford turned to the microcomputer for more user flexibility. "This was not a new application for us, but the microcomputer allowed us to share data sets across the country," he observed.

Another application in the heavy truck area is testing. Ford engineers use portable computers to enter test data that is later sent to the mainframe.

Microcomputers often allow applications normally

very low on the mainframe priority scale to be tested and processed in much shorter time periods, Roark said, adding that "the potential for application productivity is unlimited."

Roark also pointed out that many small applications can easily be performed by users without DP expertise. He said that this raises the productivity of the mainframe DP department because it frees it from a number of small operations.

"Most small applications would never be maintained responsibly by the systems organization anyway," he added. "They're too busy

with large, complex data base and communications jobs."

The relationship between the personal computer and corporate computing in terms of productivity is analogous to federal government vs. state government, Roark said. The corporate computing department makes the DP decisions and maintains corporate information, but the smaller users keep their own personal data. This arrangement, Roark said, often allows for more specific and more accurate data being kept by the user departments and ultimately translates into better productivity.

McCormack & Dodge Users To Hold Meet Aug. 21-24

NEEDHAM HEIGHTS, Mass. — McCormack & Dodge Corp. will hold its sixth annual users conference at the San Francisco Hilton on Aug. 21-24. The keynote speaker will be Dr. Alan Greenspan, chairman of former President Gerald Ford's council of economic advisers. Greenspan currently is chairman and president of Townsend-Greenspan & Co., an economic consulting firm.

A featured speaker on the second day of the conference will be baseball great Willie Mays.

Highlighting the conference will be the introduction of McCormack & Dodge's de-

velopment technology and product-user exchange sessions for different industries and hardware environments.

John B. Landry, McCormack & Dodge's senior vice-president of research and development, will address the conference on new directions and trends in applications software.

Attendee registration fees, which include product sessions, conference materials, breakfasts, luncheons and receptions are \$495 for those who register before July 29 and \$545 thereafter.

More information is available from McCormack & Dodge, 1225 Worcester Road, Natick, Mass. 01760.

Directory of Consultants In Software Published

HIGHLAND PARK, Ill. — "Leading Consultants in Computer Software" is a directory published by J. Dick & Co. More than 75% of the 1,230 consultants listed have their own modems, so clients can have instant electronic access to them.

The directory includes a Keyword Index with over 850 headings from Accounts Payable to Zilog. Consultants are indexed by the computer models and languages with

which they work and the applications and systems software in which they have expertise. The more than 17,000 index listings are arranged under each heading by city and state, so prospective clients can find the appropriate consultant who is nearest.

"Leading Consultants in Computer Software" is available for \$67 from J. Dick & Co., 500 Hyacinth Place, Highland Park, Ill. 60035.

HP3000 Payroll

Quality Software Products
from Technalysis

Compare price and performance.
Our On-Line Payroll

System Provides

- Extensive Security
- Unlimited Earnings and Deductions
- Local, State, Federal Taxes

• Gov't Labor Reporting

- 401K
- Direct Deposit
- And Much More

Call Technalysis today at
612-925-5900
we'll respond immediately.

Choose all or any combination
of our easy-to-use HP-3000
Business packages.

Fixed Assets
Financial (Accounts Payable,
Accounts Receivable, General
Ledger, Payroll)

Manufacturing/Distribution
(Inventory Management, Order
Processing, Purchasing/
Receiving, Sales Analysis)

Our products are backed by 15
years of leadership in data
processing software and services.

Technalysis Corporation
6700 France Avenue South
Minneapolis, Minnesota 55435

Telephone 612-925-5900

TECHNALYSIS
CORPORATION

ANNOUNCING

TSPRINT

Direct Spool to 328x, 3262,
and ASCII PRINTER Support

VS1 and MVS	BTAM and VTAM Support
JES, JES2, or JES3	Full FCB and UCS Support
Local and Remote Printers	No System Mods Required

Shares Printers With Other Applications

Worldwide Support



1735 E. Brookhurst
Anaheim, CA 92801
(714) 991-9460 Telex 181392

Free Trial

CALL FOR SPECIAL INTRODUCTORY PRICE

RXVP80™

Verification & Validation for FORTRAN
for an on-line demo, call

800-235-6788 (In California, call 805 964 7724 collect)
TWX TELEX 910-334-1193

The Software Workshop®
GENERAL RESEARCH CORPORATION • A Flow General Company
5383 Hollister Avenue • Santa Barbara, California 93111

Calendar

Week of July 17

July 18-20, St. Louis — **Systems Analysis and Design: Concepts and Effective Practice.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 18-20, New York — **Computer Operation: Effective Production Schedule and Control.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 18-20, Summit, N.J. — **IMS DL/I.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

July 18-20, Washington, D.C. — **Data Communications: An Introduction to Concepts and Systems.** Contact: Datapro Research Corp.,

1805 Underwood Blvd., Delran, N.J. 08075.

July 18-20, New York — **Programming in Basic.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

July 18-20, St. Louis — **The Personal Computer: Strategies for Managing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 18-20, Washington, D.C. — **Data Base Management Systems: A Comparative Analysis of General Purpose Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 18-20, Atlanta — **Evaluating, Selecting and Using Computer Software Packages.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 18-20, Washington, D.C. — **Introduction to Office Automation: Concepts, Techniques and Applications.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 18-20, San Francisco — **Computer Operation Management: Effective Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 18-20, San Francisco — **Data Communications for Microcomputers.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held in Atlanta on July 18-20.

July 18-21, Chicago — **CICS/VS Macro-Level Applications Programming.** Contact: Rosa DiSanto, Comped Technical Corp., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-21, Los Angeles — **Vsam: Its Structure and How To Use It.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

July 18-21, Denver — **Project Management.** Contact: Brandon Systems Institute, 4720 Montgomery Lane, Bethesda, Md. 20814.

July 18-22, Boston — **Structured Analysis & System Specification Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Cleveland — **Structured Analysis & Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held in Kansas City and Nashville, Tenn., on July 18-22.

July 18-22, New York — **CICS/VS Application System Design.** Contact: Rosa DiSanto, Comped Technical Corp., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Richmond, Va. — **Structured Systems Design/Structured Program Design Combined Courses.** Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

July 18-22, Portland, Ore. — **Structured Design Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Philadelphia — **Vsam File Management & Programming.** Contact: Rosa DiSanto, Comped Technical Corp., 1133 Ave. of the

Americas, New York, N.Y. 10036.

July 18-22, Long Beach, Calif. — **Structured Design & Programming Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held in Boston on July 18-22.

July 18-22, Birmingham, Ala. — **Structured Design for Real-Time Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Houston — **Structured Programming Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Houston — **CICS/VS Application Programming Macro Level.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

July 18-22, Salt Lake City, Utah — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Boston — **Data Base Administration Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Sunnyvale, Calif. — **Management Implications of Structured Techniques for Microprocessors.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Atlanta — **Project Planning & Control Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 18-22, Boston — **Financial Modeling: A Structured Approach.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 19-21, San Francisco — **DP for Senior Executives.** Contact: Peat, Marwick, Mitchell & Co., 810 Seventh Ave., New York, N.Y. 10019.

July 19-21, New York — **Basic System Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 19-21, New York — **The Personal Computer in the Corporate Environment.** Contact: Women in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

July 19-21, Hartford, Conn. — **DL/I Application Programming Workshop.** Contact: New England Data Services, P.O. Box 92, Guilford, Conn. 06437.

July 19-22, Cary, N.C. — **Introduction to Data Processing Using SAS Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

July 20, Dallas — **Computer Consulting: Tools, Techniques and Methodologies.** Contact: Laura Reed, Laura Reed CSS, Inc., 6730 L.B.J. Freeway, Dallas, Texas 75240.

July 20-21, Washington, D.C. — **The Token-Based Local Networks Forum: The Architecture Technology Forum Series.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

July 20-21, New York — **Systematic Software Testing.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 20-22, Atlanta — **Word Processing Systems: Planning, Design and Operation.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 20-22, New York — **SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

July 20-22, Boston — **Data Communications.** Contact: The American Institute for Professional Education, Carnegie Bldg., 100 Kings Road, Madison, N.J. 07940.

July 20-22, New Haven, Conn. — **Structured Cobol Programming.** Contact: New England Data Services, P.O. Box 92, Guilford, Conn. 06437.

July 20-22, Chicago — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

July 21, Nashua, N.H. — **Microcomputer System Evaluation — A Crash Course.** Contact: Seminar Administrator, New Hampshire College, Resource Center, 2500 N. River Road, Manchester, N.H. 03104.

July 21-22, Frederick, Md. — **How to Use a Personal Business Computer.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

July 21-22, Washington, D.C. — **Data Communications: Advanced Concepts, Products and Services.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 21-22, Los Angeles — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 22, Nashua, N.H. — **Business Graphics: How to Improve Presentations and Reports Using Micro Graphics.** Contact: Seminar Administrator, New Hampshire College, Resource Center, 2500 N. River Road, Manchester, N.H. 03104.

Week of July 24

July 24-26, Monterey Bay, Calif. — **Optical and Video Disk Systems.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

July 25, New York — **CICS/VS Application Programming Macro Level.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

July 25-26, Summit, N.J. — **IMS Data Communications.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

July 25-26, San Francisco — **Automatic Transfer Money/Electronic Funds Transfer.** Contact: Executive Enterprises, Inc., 33 W. 60 St., New York, N.Y. 10023.

July 25-26, Chicago — **IBM's Systems Network Architecture: A Master Plan for Teleprocessing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 25-27, New York — **The Personal Computer in the Corporate Environment.** Contact: Women in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

July 25-27, Boston — **Programming in Basic.** Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

July 25-27, San Francisco — **Improving Office Productivity: Principles**
(Continued on Page 22)

COMBOARD™/HASP the high throughput DEC/IBM interconnect

■ Your high volume data transfers to IBM or CDC centrals are achieved quickly by the COMBOARD 1231 because it supports transfer rates to 56,000 bps over private or leased networks.

■ Fast transfers between systems means higher productivity in all applications, and is particularly important in critical applications such as computer aided design. Effective system usage is increased as job turn around time is decreased.

■ COMBOARD is a 16 bit CPU based single board computer that plugs into your DEC UNIBUS™. Then the COMBOARD, not the DEC host, handles all the real-time interrupts and protocol processing associated with data communications.

■ COMBOARD 1231 is the high speed model in the series and the leader in low overhead/high throughput DEC to IBM or CDC interconnects.

■ For more details - dial toll free -

1-800-SRC-DATA

In Ohio, dial --

1-614-421-2094

SOFTWARE RESULTS CORPORATION

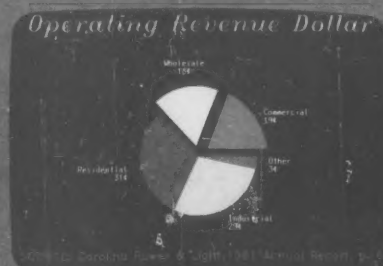
2887 Silver Drive
Columbus, Ohio 43211
TWX 810-482-1631

COMBOARD™ Software Results Corporation

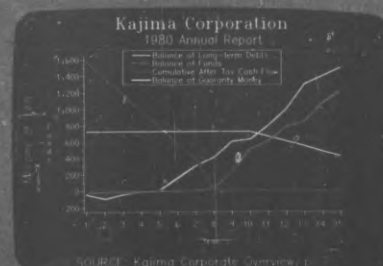
DEC UNIBUS™ Digital Equipment Corporation



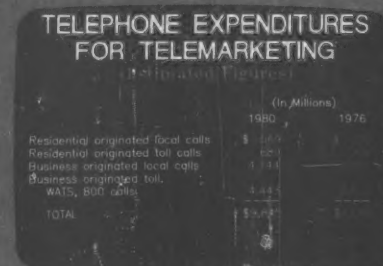
Choropleth Map of Products



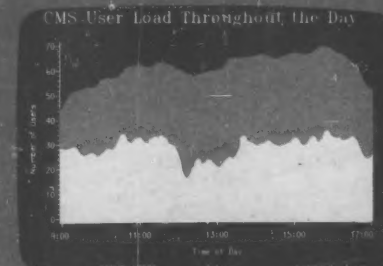
Pie Chart of Revenue



Plot of Funds*Year



Telephone Expenditures



Plot of Load*Time

SAS/GRAPH brings you Instant Replay



Since its introduction in 1980, SAS/GRAPH has provided "state of the art" software for business graphics. Now SAS/GRAPH brings you a new decision support tool—instant replay.

With the menu-oriented replay facility in SAS82 (our newest release) your DSS group can

1 generate numerous graphical analyses and store the results.

Then you can

- 2 choose the best graph—charts, plots or maps—from the annotated selection SAS/GRAPH provides and
- 3 instantly display the graph with the touch of one PF key on your IBM 3279.

It's as simple as 1 + 2 + 3. And that adds up to a big time-savings.

Think of the flexibility instant replay adds to your operation. Your DSS staff can run overnight batch jobs to graph CPU utilization reports, sales totals and production figures. The reports are ready for display at your desk the next morning.

Best of all SAS/GRAPH™ is integrated into the SAS system, so you can get the benefits of SAS for data management, statistical

analysis and report writing; SAS/ETS™ for econometric forecasting and modeling; SAS/FSP™ for data entry, editing and letter-writing; and SAS/IMS-DL/I™ for interfacing to IMS data bases. The SAS system operates on the IBM 370 Family and compatible machines at more than 5000 OS/MVS, VM/CMS, DOS/VSE and SSS sites around the world.

Call or write today. SAS Institute Inc., Box 8000, Cary, NC USA 27511-8000. Phone (919) 467-8000. Telex 802505.

SAS Institute Inc., SAS Circle, Box 8000, Cary, NC 27511 USA. Phone (919) 467-8000. Telex 802505.

SAS Institute GmbH, Rohrbacher Strasse 22, D-6900 Heidelberg 1, West Germany. Phone 06221-29014. Telex 461581.

SAS Software Ltd., The Centre, 68 High Street, Weybridge, Surrey KT13 8BL, UK. Phone 0932-55855. Telex 946138.

SAS Institute (NZ) Limited, Level 9, Greenock House, 39 The Terrace, PO Box 10-109, Wellington, New Zealand. Phone (04) 727-595. Telex NZ 31525.

SAS Software Pty. Ltd., Level 60, MLC Center, 19-29 Martin Place, GPO Box 4345, Sydney, NSW 2001, Australia. Phone (02) 235-2199. Telex AA-71499.



Calendar

(Continued from Page 20)
ples and Practices. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 25-27, San Francisco — **Structured Testing: Tools and Techniques.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 25-27, Columbus, Ohio — **Project Planning and Control Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 25-27, Toronto — **Controlling and Auditing On-Line and Distributed Systems.** Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

July 25-27, Atlanta — **Office Automation: Strategic Planning, Design and Implementation.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 25-27, Washington, D.C. — **Computer Memory Systems.** Contact: The George Washington University, Continuing Engineering Education, Washington, D.C. 20052.

July 25-27, Seattle — **Structured Analysis for Users.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 25-27, San Francisco — **Data Communications: An Introduction to Concepts and Systems.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 25-27, New Brunswick, N.J. — **Personal Computers & Networking.** Contact: Center for Advanced Professional Education, 11928 N. Earham, Orange, Calif. 92669.

July 25-27, Los Angeles — **Fundamentals of Data Processing.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

July 25-28, Dallas — **CICS/VS Application Design.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

July 25-28, New York — **CICS/VS Testing and Debugging.** Contact: Rosa DiSanto, Comped Technical Corporation, 1133 Ave. of the Americas, New York, N.Y. 10036.

July 25-28, Los Angeles — **Vtam: From Start to Finish.** Contact: Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

July 25-28, Fort Lee, N.J. — **Vsam: Its Structure and How to Use It.** Contact:

Dianne Halper, On-Line Software International, Fort Lee Executive Park, Two Executive Drive, Fort Lee, N.J. 07024.

July 25-29, Salt Lake City, Utah — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 25-29, Washington, D.C. — **Structured Design & Programming Workshop.**

Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 25-29, Houston — **Structured Design for Real-Time Systems.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

July 25-29, New York — **Structured Analysis & System Specification Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas,

New York, N.Y. 10036.

July 25-29, Salt Lake City, Utah — **Data Structured Systems Development Methodology.** Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Cage Blvd., Topeka, Kan. 66604.

July 25-29, Summit, N.J. — **CICS Command Level Programming.** Contact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

July 25-29, New York — **Infos II Data Structures Under AOS.** Contact: Data General Corp., Corporate Educational Services, 4400 Computer Drive, Westboro, Mass. 01580.

July 25-29, Annapolis, Md. — **How to Establish a Successful DP User Coordination Function.** Contact: Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.



Scottish University Increasing Strides in AI

By Bob Johnson

CW New York Bureau
EDINBURGH, Scotland — Known for its work in artificial intelligence (AI) since 1966, the University of Edinburgh's Department of Artificial Intelligence is positioning itself to increase its knowledge of the subject and, more importantly, to apply its AI achievements in order to advance information technology as a whole

in Scotland.

A preliminary draft outlining the AI department's plans was recently released. In it, the university pointed out that the AI department, which is traditionally grouped with the cognitive sciences such as linguistics, philosophy and psychology, is now attempting to broaden its discipline and work with the university's computer science and engineer-

ing departments.

Together, these three departments will form the basis of Edinburgh University's School of Information Technology, which will offer students a master of science degree.

In addition, commercial relationships with UK industries are progressing, as well as a number of development contracts. The AI department recently received funding

for a teaching post from Systems Designers Ltd., a British software house.

The school pointed out, however, that there is a natural limit to the extent to which a university department can provide service to industry. Consequently, a proposal has been put forward to create an Artificial Intelligence Applications Institute.

According to the proposal,

the AI institute would operate as a for-profit laboratory. It would be modeled after organizations like the Stanford Research Institute and Bolt Beranek and Newman, Inc., according to the school.

Languages and Systems

The University of Edinburgh gained its reputation in AI as a result of contributions to AI languages and systems. It has developed programming languages such as POP-2 and has nurtured Prolog into a practical programming tool for AI. The AI department has supplied implementations of AI languages to over 200 laboratories around the world, and it is bent on continuing its research for both academic and commercial applications.

The current developments in languages are being undertaken by a group funded by the UK's Science and Engineering Research Council (Serc). The group's concern is to provide language support for AI research nationwide in Scotland and to develop AI software for the single-user ICL Ltd. Perq machine.

"The major goal of this project is to provide the superior symbolic programming capability of Prolog in a user environment of the quality to be found in modern personal computers with improved interactive capabilities," a university spokesman explained.

AI and its relationship with robotics is another field of activity for the university. Because of its past interest in robotics, particularly the potential usefulness of fast-moving robots for assembly, the AI department has undertaken a study of their dynamic behavior, design and control. Research in this area is being funded by Serc and is being conducted by a group called the Robot Language Working Party, headed by Robin Popplestone, one of POP-2's developers.

Right now, a robot command language called Rapt is under development which, according to the AI department, is intended to make it easy for people who are computer experts to program an assembly robot.

"The idea is that the assembly task should be programmed in terms of the job that is to be done and how the objects are to be fitted together, rather than in terms of how the manipulator should be moved," the school said.

The school's AI people claim an intelligent robot needs an accurate representation of its world internally that allows it to predict the results of planned actions.

Brand new terminal. Same old story.

If you're looking for the best terminal value, look to a familiar name: TeleVideo. The story of our new 924 is the same story you've heard for the last four years. We've combined the best innovations in technology, design, and quality manufacturing to give you everything you want in an advanced terminal. And we've done it at a price that can't be beaten.

The 924 is comfortable, with a tilt and swivel non-glare screen. Its lightweight, low profile keyboard fits your fingers naturally. Our 32 programmable, non-volatile function keys turn often used instructions into simple one-button commands. The 924 provides extra display features, including full screen editing, character and block graphics, definable scrolling regions for multiple window operation, plus 32 character-by-character visual attributes.

The 924 has the intelligence you need too, with logical attributes to define protected and unprotected regions. And, with standard one page or optional four page memory, there's plenty of room to work.

If you don't need all the power of the 924, try our 915. It has all the design advantages of the 924, and is the superior terminal in its class. It just costs less.

The 924 and 915 mark a great new chapter in the TeleVideo story. And, like all TeleVideo terminals, they're reliable performers, backed nationwide by General Electric Instrumentation and Computer Service Centers. Contact us today about the 924 and 915 story and you'll enjoy the happy ending. Call 800-538-8725 (in California call (408) 745-7760), or send us this coupon.

TeleVideo Systems, Inc.
Dept. 2000
1170 Morse Avenue, Sunnyvale, CA 94086

Yes, I'd like to know more about
TeleVideo's new 924 and 915 terminals.

Name _____
Address _____
City _____
State _____ Zip _____
Telephone (____) _____

Santa Ana/California, 714-557-6095
Sunnyvale/California, 408-745-7760
Atlanta/Georgia, 404-399-6464
Dallas/Texas, 214-980-9978
Chicago/Illinois, 312-351-9350
Boston/Massachusetts, 617-668-6891
New Jersey/New York, 201-267-8805
Woking, Surrey/United Kingdom, 44-9905-6464

 **TeleVideo Systems, Inc.**

EDITORIAL

Your Unacceptable Alternative

The job of planning and buying corporate computer resources may be slipping from the hands of the DP department and falling into the laps of top executives.

Many companies are beginning to view computer hardware more as a commodity than a business tool — and with good reason. Expensive computer systems sometimes have almost no resale value a few years after they are purchased; they have been made obsolete by newer, faster and more efficient machines. And many companies' needs change so fast that computer systems can become outdated in less than five years. In both cases, the result translates into big losses for companies.

In addition, hardware acquisition has become an almost impossibly complex task. The question of whether to buy, rent or lease hardware has always been a difficult one. Today, however, the numerous purchase, rental and lease agreements — complicated by the deals offered by plug-compatible and third-party vendors — make the average DP manager's head spin. As one DP manager recently told *Computerworld*, "It's hard to keep track of who's on first" [CW, June 27]. Processor deals that five years ago could be handled by the DP department now require a team of financial and legal experts. Many larger companies have developed specialized groups within the DP department to analyze acquisition deals; smaller companies rely on financial experts within the firm and hope they know enough about computers to be of some assistance.

Capacity planning is also becoming more difficult. A majority of DP executives recently surveyed by *Computerworld* found they required a larger processor a lot sooner than they expected (story in this issue). In fact, several said their capacity planning efforts were reliable for only one or two years. The reason: almost uncontrollable demand for computing power by end-user departments accompanied by rapid-fire advancements in hardware technology.

The increasing complexities in the purchase and planning of computing power offer new opportunities for DP management to increase its visibility and to strengthen its position at the highest levels of the corporation. Capitalizing on these opportunities, however, will require DP managers to upgrade their business, legal, financial and interdepartmental skills.

The alternative is to be left behind in the computer room — an alternative that must be considered unacceptable both to DP managers and to their corporations.



LETTERS

Set Operations Needed

It was most distressing to learn from Vincent C. Rauzino's In Depth article, "The Present and Possible Future Data Base Machines" [CW, June 6], about the apparent direction being taken by all current data base machine manufacturers. They all seem to have decided that the relational approach is the wave of the future and that building a machine that is solely devoted to supporting that data model is the way to go.

While this may be true for moderate-size data base applications, these manufacturers have fallen into the same trap the developers of hierarchical and network models found — namely, that the logical view of the data has a direct physical analog in the storage structure. The hierarchies and the networks have embedded pointers that physically map into the links between entities, and the relational model has the data stored like the logical tables.

A good portion of the DP world naturally maps into hierarchies or networks, while other portions have the natural look of tables (or some other structure). Typically, more than one data model can be used, and the choice should be up to the user.

With all current implementations, if your data model does not match the storage structure, it is very difficult and inefficient to support the application, even if you have special-purpose hardware. What is needed is a collection of operations that relaxes system dependence on a specific structural choice.

This body of operations over multiple structure types is provided by extended set theory, as developed by D.L. Childs of Set Theoretic Information Systems, which is located in Ann Arbor, Mich. Extended set theory underlies all logical and physical views of data available from any of the current data base management

systems (DBMS).

This means that all DBMS operations currently being performed can be expressed in terms of set operations no matter what data model is being used. One of the unique aspects of the relational data model is that the operations available were defined at the same time the structure was presented. Extended set theory provides an enriched collection of operations that allow all the data models to be represented not just singly; multiple views of the same data can be supported. That is what data structure independence is all about — separating the logical and structural representations.

The well-defined mathematical basis for set theory gives the DBMS designer and implementor the tools necessary to build effective and efficient systems. There is nothing magical about set theory that will force an optimal design, but it does provide the tools for quantifying the effect of design choices, especially as the associative, commutative and distributive properties of set operations are put to intelligent use.

Needless to say, I strongly believe that the future of data base machines should lie in the development of devices that support set operations and perform intelligent storage management based on the principles of set theory.

Clifford R. Kuhl
Vector Research, Inc.
Ann Arbor, Mich.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters may be edited for purposes of brevity and clarity. Letters should be addressed to Editor, *Computerworld*, 375 Cochituate Road, P.O. Box 880, Framingham, Mass. 01701.

DATA PAST

Five Years Ago

July 3, 1978

WASHINGTON, D.C. — The DP job outlook for new college graduates was considered excellent, according to a U.S. Department of Labor bulletin that listed large numbers of job openings entered by employers at the 2,500 Job Service offices in the U.S.

Ten Years Ago

July 4, 1973

WASHINGTON, D.C. — Clarence M. Kelley, one of the nation's foremost promoters of computerized law enforcement, was confirmed by the Senate as the director of the Federal Bureau of Investigation.

Kelley allotted 5% of the police budget to DP.

ATLANTA — Cobol, additional distributed data processing capabilities and a doubled main memory capacity became available to Series/1 users following an IBM announcement of 12 upgrades to that system.

CINCINNATI — An appellate court here, in upholding a lower court ruling, ordered a Toledo, Ohio, gas company to enforce a personal notification system and rely less on its computer in its billing practices.

SOFTLINE/Werner L. Frank†

Why Have a Micro-Mainframe Connection?

This is the year for the microcomputer to meet the mainframe. Announcements of this event are in abundance as both hardware and software vendors seek to exploit the new market opportunity that the personal computer makes available. This interest is furthered by the perplexity found in the management information systems departments of larger organizations, where the proliferation of the microcomputer is challenging the long-standing dominance of centralized computing.

How do the large central files and associated applications of host computers, geared for terminal access, become useful to hundreds of users armed with personal computers? And how can the rich, new body of software developed for the microcomputer, inherently more user-friendly and functionally responsive, become a computing adjunct to the powerful software associated with mainframes? How do these two technologies, in seeming opposition, learn to coexist and reinforce each other?

Some possible reasons for having a micro-mainframe connection, as well as the different levels of sophistication facilitating the union, will be explored here.

What could be the rationale for furthering communications between an intelligent device, such as a microcomputer, and a more powerful, often remote computer, be it mini or mainframe in size? There are basically three reasons for such a lash-up. The first relates to making the micro behave from time to time like a terminal connected to a host computer. The second is transferring files of information between the micro and the mainframe. The third concerns the opportunity of creating a distributed

This is the first of a two-part series on "The Microcomputer Meets the Mainframe."

DP environment.

With respect to the option of turning a personal computer into a terminal connected to a host computer, it may be desirable to take on the role of an IBM 3270-type device when connecting to an IBM mainframe — or as a VT100 when connected to Digital Equipment Corp.'s VAX-11. In such modes of operation, the personal computer is emulating the physical characteristics of a target terminal that may be the normal, or native, device typically associated with a specific computer executing a specific mainframe-based application.

In addition to the apparent physical attributes of the native terminal as perceived by the human operator, it is also necessary to replicate the communications and message protocols required in that native mode of operation. Thus, there may be a requirement for asynchronous or synchronous communications, just as there may be special formats required by the host computer and its software operating environment. In this special role, it can be said that the microcomputer has adopted the personality and the behavior of a specific terminal in order to execute an application that is already resident on the connected host computer.

Three requirements must be met to accomplish the objective of emulating a terminal by an intelligent device such as the microcomputer:

- **Hardware.** An appropriate hardware model is introduced, typically a

specially built circuit board, to provide the proper physical features associated with the communications protocol. This board is inserted into an available slot in the chassis of the microcomputer housing unit. Alternatively, it is possible to achieve similar results by introducing a protocol converter, a second computer interfacing the natural communications discipline of the desktop computer with the protocol operating in conjunction with the mainframe. The protocol converter will perform the necessary conversion from one communications mode to the second.

- **Software.** A computer program is prepared for the micro that, upon execution under the aegis of the adopted operating system, will both accept the data to be transmitted to the host by properly packaging it in the format expected by that host when in the sending mode and unpack messages from the host for local presentation when in the receiving mode.

- **Systems.** There must be appropriate assignment of keyboard and display features in order to simulate the physical aspects of the copied terminal. This is a mix of software and documentation, the latter giving usage and mapping instructions to the operator regarding the physical requirements of one device emulating another.

In this terminal mode of operation, the micro-mainframe connection has not really added anything to the computing environment other than making use of a personal computer in the role of a rather dumb terminal. In fact, when the session is over, nothing more or less has been accomplished than the exercising of an application resident on a host.

So why would one be interested in such a lash-up? There are three rea-

sons for this approach:

- **Economical Operation.** In the event a user has need for accessing a host system at all, and also wishes to enjoy personal computing facilities, then employing one set of hardware is obviously the most economical alternative. The marketplace is recognizing this benefit, and we are witnessing the movement of terminals being transformed into personal computers and vice versa.

The simplest example is the dual operation possible with the IBM Personal Computer, which can function in its natural desktop mode, as well as perform as a remotely connectable terminal in the presence of an asynchronous or bisynchronous circuit board coupled to a communications modem.

An even more elegant configuration is now possible that readily adapts to the already in-place clustered terminal systems. This is the IBM offering of a connection from the 3278 terminal to the Personal Computer CPU. This provides, upon keyboard selection, either a 3270 model of operation or a free-standing Personal Computer performance.

Several companies have recognized the sitting duck aspect of all of the 3270 systems installed throughout the larger computer user base and, accordingly, are now offering an obvious alternative. They make available off-the-shelf circuit boards and software that transforms the Personal Computer, via the coaxial cable connected to the 3274/3276 controller, into the 3278, and sometimes 3279, terminal device.

Examples of such vendors are Technical Analysis Corp. of Atlanta, which offers Irma, and Forte Data Systems, Inc. of Santa Clara, Calif. (Continued on Page 26)

HUMAN CONNECTION/Jack Stone†

Micros Need Same Systems Planning as CPUs

Strong words these, but Richard Anthony, general manager and chief executive officer of Norstar Communications, part of the Broadmoor Group of St. Louis, was quoted as saying, in effect, that improper business use of micros could lead to company crises [CW, June 27]. His explanation of this follows.

"The first crisis to be met is that of data processing expertise. There is a conspicuous lack of adequate implementation and support assistance provided by microcomputer vendors. In small firms, where micros will function independently with a limited number of different applications, the crisis is principally associated with implementation or expansion. These firms may be able to find competent outside assistance that will allow them to tough it out until expertise in the machine and applications is gained.

"In larger firms, microcomputers are likely to find applications in a number of diverse situations. Cost and performance will dictate the

This is the last in a three-part series on "The Coming Crisis in Business Microcomputers."

consideration of networking and communications. As the use of microcomputers increases, requests for assistance with inevitable problems and requests to access central data bases will put important demands on DP staffs not currently equipped to handle them. The absence of expertise will undoubtedly lead to communications problems between DP and users, as well as to requests for DP staffing in user departments.

"The second crisis is that of data security and information integrity. In small firms, implementation of an automated system often occurs without adequate regard for manual data handling procedures, file security and monitoring information integrity.

"In large firms, the potential for the proliferation of data bases that

are controlled and maintained by groups outside of the computer center raises the same concern for standards for data handling and accuracy of the information upon which reports and analyses emanating from these groups are based. Communications and networking adds additional risks to data base security.

"A third crisis is that of technology. The rapid changes in computer hardware with the attendant media coverage has caused a stampede of gadget enthusiasts who will gobble up every add-on the vendors can sell.

Crisis of Organization

"Finally, there is the crisis of organization," he said. "In small firms, the conflict will be interpersonal as new expertise will yield new responsibilities and power. In large firms, the conflict will be general and interdepartmental.

"The crises of expertise and informational integrity, as symbolized by the pocket calculator vs. computer system, will militate toward stan-

dardization and coordination, as well as the acquisition of the expertise required to support microcomputers.

"The need to assess responsibility for data security, support and planning will precipitate organizational changes.

"Only relatively few — some estimate 10 to 40 — of the Fortune 1000 companies have begun large-scale planning and implementation of the office of the future, which integrates all aspects of communications and information processing. Those firms that have undertaken such an endeavor have found that the creation of an interdisciplinary task force is most appropriate.

"The amount of time and effort that a firm will need to devote to the care and feeding of microcomputers will depend upon its size and the homogeneity of its operations. Success will depend upon how well business will perceive the operating requirements of the microcomputer and adapt organizations and expectations to these requirements."

Exploring Micro-Mainframe Connections

(Continued from Page 25)

with the Pcox interface. In all these cases, the Personal Computer can emulate a 3278. But most important, the existing 3270 communications network to the mainframe remains intact and operative. In fact, the approach works whether the terminal controller is directly channel attached or remotely connected to a 3705 communications front end or whether it is operated in IBM's Binary Synchronous Communications mode or IBM's Systems Network Architecture/Synchronous Data Link Control protocol.

● **Gateway Access.** There may be a need for the user to access a number of host systems via a variety of communications protocols. From time to

time, the same individual or the same device may require connection to the corporate mainframe, which may be an IBM application or 3101 asynchronous operation for a second situation. On another occasion, this user may have a desire to connect to a dedicated Hewlett-Packard Co. HP 3000 computer, which serves his department's needs for order entry and inventory control. Subsequently, the same user may wish to sign into a DEC VAX-11 system or to a commercial time-sharing vendor.

Finally, there will be circumstances in which connections to publicly available data bases become of interest. For all these cases, the intelligent terminal or personal computer is the rational way to achieve a gen-

eral gateway, or access method, to varying computer makes and applications, each having its own line and message disciplines. This flexibility may also be related to mobility. The access may be sought from different terminal devices, most often from the office, but also from the home and sometimes in the midst of travel.

● **Footprint Problem.** There may be a space limitation on a desk so that there is only room for one device that can handle both the terminal and the personal computing needs of the individual. However, space may not be the only consideration. There is also the benefit of rationalizing the cables, the modems and the local storage devices, which comes about from dealing with one integrating

set of hardware.

The terminal-oriented communications schemes identified above are readily embellished to include more features than simply linking the micro to a second computer. The most popular additive is the provision for capturing the data presented on the face of the video and retaining it for local disk storage. A sophistication beyond such a simple screen dump is the ability to do some logical selection from the video presentation. These features are natural steps to the second aspiration of linking micros to mainframes, for example, file transfer.

File transfer between micro and mainframe can be a simple task and fall out from the terminal connection methodology described up to this time or it can be a complex process involving special data extraction programs operating at both ends of the two-computer connection. The technology for file transfer has actually been evolving amidst the microcomputer community for a number of years and has reached a rather sophisticated level, at least as far as asynchronous communications operating with the RS-232C interface and standard modems is concerned.

The interest in file transfer among microcomputer enthusiasts has been motivated by the desire to move microcomputer programs from one system to another and overcome, via direct communications, the overwhelming barrier that varying CPUs and incompatible disk devices and formats presents to two users. Dozens of commercially available programs now provide quite flexible means for attaching two computers and driving the transmission process through well-conceived menus and selection criteria that govern such parameters as:

- Type of file — Ascii, binary or program.
- Line rate — typically 300 or 1,200 bit/sec.
- Line type — full duplex or half duplex.
- Delay times — time-outs and so on.
- Special characters — transfer controls, end of line and so on.
- Parity type — odd and even.
- Modem type.

The dial-up, sign-in and transfer process can often be handled in an automatic manner through prestored equivalents of executive programs. In addition to being able to select the appropriate communications environment, these programs also provide error-detection and correction schemes, depending upon the nature of the transmission procedure. Examples of general-purpose software supporting such capability are Move-It of Woolf Software Systems of Canoga Park, Calif., Ascot of Dynamic Microprocessor Associates of New York and Smartcom II from Hayes Microcomputer Products of Norcross, Ga.

This technology has now been recognized for adaption to the micro-mainframe environment. Here the motivation primarily comes from recognizing the existence of lots of data at the mainframe and the desire to download files for subsequent use

(Continued on Page 28)

The Economics of Office Automation

Personal computers are designed for single users.

So when you string them together on a network, you pay for a lot of duplicated features. Disk drives. Operating systems. Peripheral controllers. And application software.

Not to mention the cost of the hard disk needed for mass storage horsepower.

Better idea: look for the system designed for multiple users.

Molecular Computer, the unique local area network-in-a-box. For each added user, you add a microprocessor and RAM memory to the box. Up to 64 on-line users are plugged into a common

data base (up to 272 MBytes), shared CP/M®-compatible software, printers, modems, and each other.

You get more performance than a personal computer network. For less money.

In fact, list price for a typical seven-user Molecular system is under \$3,000 per user. Including terminals, software, and a letter quality printer. Cost-per-user decreases as more users are added.

So use your personal computer to run spreadsheets at home. And build your office of the future around Molecular.

We're changing the economics of office automation.

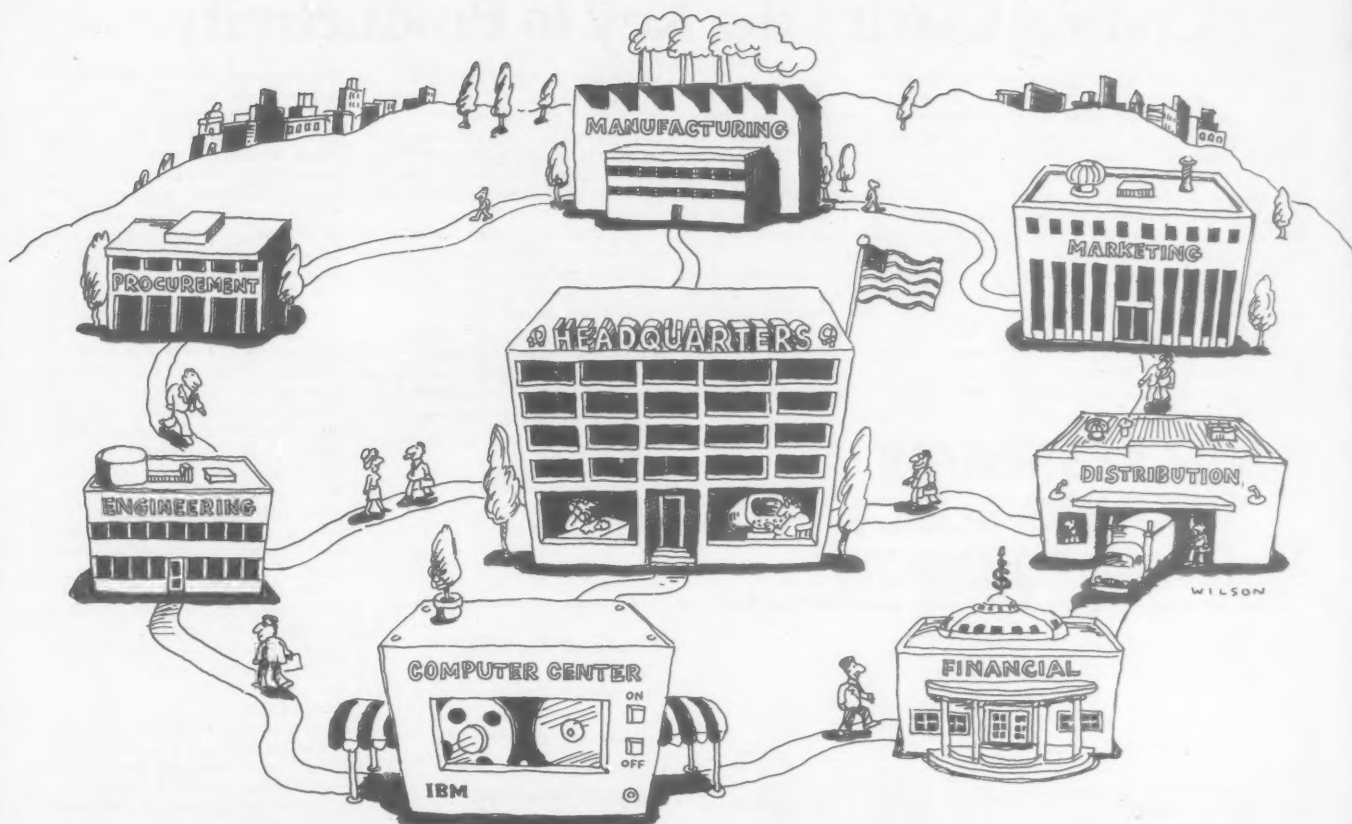
PERSONAL COMPUTER NETWORKS ARE INEFFICIENT.



Corporate Headquarters 251 River Oaks Parkway, San Jose, CA 95134 (408) 262-2122, Greenwich, Connecticut (203) 661-8003
Dallas, Texas (214) 484-1868, McLean, Virginia (703) 448-6080, Tallahassee, Florida (904) 878-6282,
Lombard, Illinois (312) 960-4440, London, England (01) 568-5272, Frankfurt, Germany (06196) 45030.

CP/M is a registered trademark of Digital Research, Inc.

XEROX



Presenting a complete, unified software system for manufacturers.

Developing a manufacturing planning and control system takes skill and time. You can buy various parts from different vendors and build the interfaces yourself. Then test and implement the software.

Or you can have the Xerox Manufacturing System.

A Single Solution

An advanced software architecture from Xerox has done all the work for you. Integrated applications, systems software, analytical tools, and personal computers joined in one complete, unified system.

The Xerox system allows every department to work with information from the same database. Manufacturing, finance, marketing, distribution, engineering, procurement, and planning. All basing decisions on information as timely as your most recent receipt, issue, purchase order, or sales order.

Profit or Loss

The closed-loop business applications give you on-line data. Master scheduling, MRP II, inventory, order entry, costing, production control, procurement, receivables, payables, and financial modules are combined in the most powerful operating management tool available today.

The system will help you plan and execute your priorities and manage manufacturing costs at optimum levels.

It could make the difference between profit and loss.

Something for Everyone

Easy-to-use programs are provided for inquiry, reporting, and manipulation of data. For modeling, forecasting, graphic display.

And a personal computer link to your mainframe, the first practical application of its kind.

Today and Tomorrow

We can configure a system that's yours alone. One that matches your business needs today and will grow with you tomorrow.

Completely portable across all IBM 4300, 370, and 3000 computers and operating systems, the same Xerox software can be used when you upgrade your hardware.

You can use the Xerox Manufacturing System on your IBM computer or, as an option, start with the software on our timesharing service. Then, when you're ready, move the software and database in-house. In one weekend.

Our manufacturing systems run on Digital VAX minicomputers, too.

With You All the Way

Xerox systems are backed by a professional organization that understands manufacturing. We've installed computer-based systems in more than 500 manufacturing plants.

Implementation support, consulting, and education services are available from 23 Xerox offices in the United States and Europe. Solid insurance for continued successful operation of your software.

For more information, call toll-free (800) 323-2818, Operator 148. In Illinois, call (800) 942-1166.

Or return this coupon for a copy of our new *Xerox Manufacturing System* brochure.

Xerox Computer Services

CW 7/4/83

c/o Ron Rich, 5310 Beethoven Street, Los Angeles, California 90066

Send me your *Xerox Manufacturing System* brochure.

I'm interested in your software for:

☐ IBM 43XX ☐ IBM 370 ☐ IBM 30XX ☐ Digital VAX

NAME/TITLE

COMPANY

STREET

CITY

STATE

ZIP

PHONE

READER COMMENTARY // Jerry Sitner

Coding Clarity the Key to Productivity

Data processing will continue to fail in its quest to measure programming productivity for the same reason it has failed to solve the overburdening program maintenance cost problem. All data processing has accomplished to date is to recognize, by trial and error, that which is not the basis for programming productivity measurement.

We in DP are beginning to accept correctly that lines of code do not measure productivity. What contribution to productivity is made if a programmer produces twice as much code as others and then takes four times longer to test, debug or modify

that coding.

We also are starting to realize that number of programs completed, without taking into account size and degree of difficulty, is not a measure of productivity.

What then should be the measure of productivity? The only valid measure of programming productivity is source coding clarity.

Readability and understandability of the methodology being used to implement each program function are the basis of productivity in both new program development and maintenance. The more understandable coding is, the less time it will

take to test, debug or modify it.

This is not only the case with placing the initial program into production. Over any program's life cycle, numerous modifications can be expected. Until DP can accept this, the program productivity problem will not be solved.

The creators of Cobol, nearly 25 years ago, clearly recognized this. At that time, the brains of the most prestigious computer companies and users met to develop a common computer language that would be compatible with all hardware.

The consensus from those meetings was that the No. 1 objective for

this proposed common language (it had not been given the name "Cobol" as yet) was readability.

These giants of DP were keenly aware of program productivity and maintenance costs even then. They knew the devastating effect of non-clarity programs on DP budgets. In all their wisdom, they came up with Cobol, which was designed specifically to solve productivity problems.

For reasons such as hardware memory limitations, excessive CPU time and so on, which were not what the creators of Cobol had in mind, DP chose to replace ease of reading with ease of writing as its No. 1 objective. We know now that these reasons are not valid. This shift of objectives was accomplished by encouraging speed writing in place of the intelligent use of English. Speed writing produces 'broken' Cobol coding. 'Broken' Cobol, like 'broken' English, is difficult to understand.

This approach ultimately eliminated ease of reading from any list of priorities. I am sure you have seen programs held from production because the documentation folder was not completed; but have you ever heard of a program being rejected because the source coding was unclear?

The result of all this was to deal DP the most crippling blow: It has cost business billions of dollars.

Although the committee members knew full well the memory limitations at the time, which were much more severe than at present, they still insisted that the most important objective was ease of reading: Witness the allowed 30 positions for data and paragraph names.

If DP is to have any chance of dramatically improving programming productivity, it must judge productivity, using the only valid measurement available, namely, clarity of coding. Our Cobol forefathers tried to tell us this 25 years ago.

Sitner is president of Sitnerology Co. in New York.

Micro Meets Mainframe

(Continued from Page 26)

with some of the powerful micro-based software, such as spreadsheets, business graphics, word processing and data management. Examples fulfilling this expectation are MBA, the integrated software package of Context Management, and Visianswer, a joint product of Visicorp and Informatics General Corp.

While it may be cost-effective and operationally neat to have one device serve two different purposes from time to time and to facilitate the transfer of files between two systems, the major rationale for making the personal computer-to-mainframe connection is really motivated by the desire to exploit the respective resources of the large and very small DP systems.

Frank is an independent consultant and president of the Werner Frank Computer Group located in Calabasas, Calif.

IBM SYSTEM/38 BUILDING BLOCK SOFTWARE... READY TO GROW!

Get the most from IBM System/38 processing capabilities with Resource Management Systems (RMS/38) from PCR.

It's all native mode application software. Ready to go to meet computer needs today. Ready to grow when computer needs change tomorrow.

Build a Solid Foundation

Build a comprehensive data base management system with a full range of applications integrated in flexible modular design.

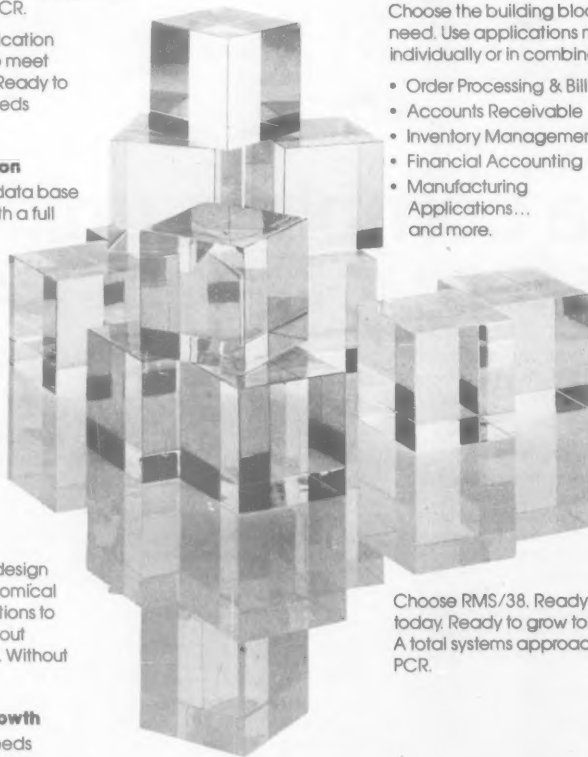
Distribution, Manufacturing, Financial. You specify user functions. RMS/38 delivers high performance, speed, ease and accuracy to carry the load.

Create a Flexible System

Create the system that suits your special requirements. Modular design makes it easy and economical to expand RMS/38 functions to your unique needs. Without extensive modifications. Without exorbitant costs.

Enjoy a System for Growth

When your computer needs change, use advanced System/38 programming techniques, a complete reference file and structured, well-documented RPG III code to expand capabilities without expanding costs.



Choose Building Block Software

Choose the building blocks you need. Use applications modules individually or in combination.

- Order Processing & Billing
- Accounts Receivable
- Inventory Management
- Financial Accounting
- Manufacturing Applications... and more.

Choose RMS/38. Ready to go today. Ready to grow tomorrow. A total systems approach from PCR.

Call (312) 932-2200 for complete details.
Or write:

PCR professional
computer
resources

2021 Midwest Road Oak Brook, IL 60521
Chicago • New York • San Francisco

Interface Ties 'SAS' Software, Adabas DBMS

WASHINGTON, D.C. — Decision Resources Corp. has announced an interface between SAS Institute, Inc.'s SAS statistical software and Software AG of North America, Inc.'s Adabas data base management system.

Called Extract/A, the interface is an SAS procedure that enables users to retrieve a subset or all of the data stored in an Adabas file. It operates on IBM 370, 30 series, 4300 series and compatible hardware with the IBM OS operating system and requires Adabas Release 4.1 or later and SAS Version 79.5 or later.

The package can create an SAS data set with only the data users need for analysis, a spokesman said. Record selection utilizes the inverted file access methods of Adabas.

Extract/A handles differences between Adabas fields and SAS variables by referencing the Adabas data dictionary to learn how to read and interpret the names and values for each Adabas field. File security is maintained through passwords and cipher parameters.

Extract/A is priced at \$9,500 from Decision Resources at the Third Floor, 1701 K St. N.W., Washington, D.C. 20006.

End-User Training Examined: How Is It Best Implemented?

Special to CW

Whether it comes through the information center, management information systems (MIS) or corporate educational services, end-user training has become a critical support function in most organizations.

During a recent meeting of Fuse, Inc., the independent users organization for Information Builders, Inc.'s Focus product, several in-house education specialists examined the results of end-user training in their firms.

At RCA Corp., DP training is available to anyone within the company who wants it, courtesy of the firm's Corporate Information Systems & Services Department in Cherry Hill, N.J.

Several IBM operating environments are offered, including CMS, MVS and TSO. Training is available on many of the proprietary software products running on those systems.

"We have found that live training is highly effective for us," said senior systems representative Barney Milstein. "Sometimes we travel to user locations to present classes, but most often users travel to our training center. Average classes are 10 to 15 people, and in the case of training on the Focus system, we spend two days at the introductory level and two days in the advanced classes," he said. Lectures are combined with problem-solving sessions at terminals and RCA-generat-

ed exercises.

Milstein's group also provides RCA users with a monthly newsletter that includes new product releases, vendor literature and hints for product usage. "We also schedule client visits to consult on specific product applications and explain to management how a particular piece of software can be used most effectively," Milstein said.

Telephone support is a standard service provided by the department. User support of the Focus product is aided by an in-house Focus users group.

At the Coca-Cola Co., training is available to all users of the firm's centralized IBM 3081, (Continued on Page 36)

'Tell-A-Graf' Targets HP 9000

'Tellaplan' Out for IBM, DEC Users

SAN DIEGO — Integrated Software Systems Corp. (Issco) has introduced Tellaplan, a project planning, report and schedule charting system for Tell-A-Graf users in IBM MVS or CMS or Digital Equipment Corp. VAX/VMS environments.

Issco also announced the availability of its Tell-A-Graf software in a multiuser environment on the Hewlett-Packard Co. HP 9000 desktop workstation under its HP-UX version of Unix.

Tellaplan provides capabilities to prepare plans and monitor schedules, including full reporting of staff requirements by skill type and actual-vs.-budget costing by department, a spokesman said. English language commands are used.

The product allows customizing of charts and can generate more than 25 types of cost/resource charts in a variety of formats. Revisions can be made while the project is in progress. Tellaplan allows "what if" anal-

ysis without modification of the original plan and computes the path between tasks every time the plan is updated.

Planning and scheduling charts can be produced for an individual schedule, departmental schedule or as a top-level overview.

Tellaplan will be available in September at a cost of \$12,500 for large mainframe computers, with an introductory price of \$8,800 until Oct. 5. Prices for smaller computer environments start at \$3,200.

HP 9000 users running Tell-A-Graf can generate charts and graphs locally to represent data within the workstation or downloaded from the mainframe, the spokesman said. Tell-A-Graf for the HP 9000 will be available in August at a price of \$9,500.

Issco is located at 10505 Sorrento Valley Road, San Diego, Calif. 92121.

'Mantis' Allows Access to IBM DL/1

CINCINNATI — Cincom Systems, Inc. has enhanced its Mantis fourth-generation application development system to allow direct access from Mantis programs to IBM's DL/1 data base files through the Mantis-DL/1 Access Logical User View.

The Mantis-DL/1 Access Logical User View is available for users of IBM's DL/1 data base on IBM and plug-compatible systems under DOS or OS with CICS, using Mantis Release 3.5 and above.

Programmer access to a DL/1 data base is accomplished

through the logical user view concept of Mantis, the vendor noted. This reportedly enables programmers to design access strategy on-line, without the need for I/O subroutines. Inquiry and update programs can be developed and tested on-

(Continued on Page 36)

Save up to 50% on VSAM/DASD requirements with the VSAM Space Utilization Monitor, offering:

VSAM file design evaluation

System generated performance recommendations resulting in dramatic improvements

Utilization statistics based on data set interrogation

VSUM... and then some... the ultimate VSAM performance tool!



Call collect **203 529-7128** or return this coupon to our attention.

- ☐ Send me **VSUM** for a 30 day free trial.
☐ I'm interested, please provide more information about **VSUM**.
☐ Also please provide information about the complete family of software products available from **STAR**.

Operating System: ☐ DOS ☐ VS1 ☐ MVS

Name _____ Title _____
 Organization _____ Telephone _____
 Address _____
 City _____ State _____ Zip _____

CW-7/4/83



The same, identical software you develop for our largest HP3000 can run on our smallest.

Most companies need a range of business computers. What they don't need is the high cost of converting software to run on the different systems.

With the HP 3000 family, that cost is zero. Because we never change its compatibility, even though we're constantly expanding its performance.

Without rewriting a word of code or recompiling, you can use the same programs right up the line. From our inexpensive Series 39 that can serve a single user in a branch

office. To our Series 68 distributed mainframe that can handle 400 in your regional headquarters.

That frees you for more productive things like reducing that applications backlog. Here again, the HP 3000 can help dramatically.

Its special programmer productivity tools have cut months off program development schedules. And, with our long list of off-the-shelf software packages, there are many programs you may not have to write at all.



And vice versa.

But your savings actually start with the hardware. The HP 3000 family delivers equal performance for up to 40% less than comparable systems. And their flexible communications make it easy to build local and remote networks, as well as links to IBM, one step at a time. You get what you need now. Then add more as you grow.

Small wonder the HP 3000 is one of the most popular business computer families in the country. If you'd like to see it in action, call the nearest HP office listed in the white

pages. Ask for a Business Computer Specialist. Or write to Tom Rappath, Hewlett-Packard, Dept. 03183, 19447 Pruneridge Avenue, Cupertino, CA 95014. In Europe, write to Henk van Lammeren, Hewlett-Packard, Nederland B.V., Dept. 03183, P.O. Box 529, 1180 Amstelveen, The Netherlands.



**HEWLETT
PACKARD**

BD02302

CW in Search of Stories On Changing Nature of DBMS

Data base management systems (DBMS) are increasingly in the news these days, and *Computerworld* wants to hear your views on the changing nature of these products for an upcoming Special Report.

The Special Report will appear in the Oct. 31 issue. It will include applications stories or case studies, which describe an end user's experiences with a product, and tutorials, which are non-product-specific articles describing a particular DBMS idea or concept.

Tell us how the use of DBMS has impacted your organization.

Describe what you see as the changes that are occurring in these types of products. Will relational systems make their way into traditional IBM IMS shops?

The articles should be four to six pages long and must be typed and double-spaced. Preference will be given to articles that include black-and-white photos and/or camera-ready artwork.

All material must be received by Sept. 5. More information is available by contacting Paul Gillin, Senior Writer, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

On 'Marian,' 'Harold'

Firm Announces Price Hikes

MEMPHIS, Tenn. — Computer Software Unlimited, Inc. has announced a \$1,000 price increase on two of its products: Marian, an on-line librarian package, and Harold, a teleprocessing monitor. Both packages were designed for IBM 370 and 4300 series processors.

Marian's features include full screen updating, elimination of repetitive programming tasks and automatic matching of compilation diagnostics to source code. In addition, the package features positive protection of source programs and full data compression, reducing the disk requirements for source programs, the vendor said. Marian now costs \$9,000.

Harold is an entry-level teleprocessing monitor designed to support Marian and user applications. User applications developed under Harold are upward-compatible with other teleprocessing monitors, such as IBM's CICS. Harold costs \$3,000, the vendor said from 1806 Malabar Drive, Memphis, Tenn. 38138.

Sperry Tailors Mapper Version For System 80s

BLUE BELL, Pa. — Sperry Corp. has announced Mapper 80, a new version of its Mapper applications development system that is tailored for the company's System 80 family of computers.

Mapper 80 was designed to allow end users to write their own programs and generate reports using the mainframe data base. The tool can also be used for application development by programmers, the spokesman said.

The interactive package features an integrated relational data base architecture and can operate with the full range of local and remote Sperry workstations. The system operates with more than 100 English commands that are used to construct most applications. The package is a compatible subset of the Mapper 1100 system and operates in parallel with other System 80 software.

The package will be available from Sperry Corp. in November at a license fee of \$204/mo. through P.O. Box 500, Blue Bell, Pa. 19424.

Tell end-users where to go:

Computer Associates presents CA-UNIVERSE," a relational data base management system that enables end-users to manage and process their own information—freeing programmers for greater productivity.

Computer Associates can improve your entire company's productivity with our new CA-UNIVERSE.

It eliminates redundancy, improves the integrity and security of data, and brings efficiencies from the data center into other departments.

Because it's a powerful relational data base management system, CA-UNIVERSE contains the application development tools that enable programmers to reduce maintenance programming and spend more time on new programming.

Applications backlog is reduced because CA-UNIVERSE lets end-users create, enhance and modify programs all by

themselves. And they have simple, immediate access to the data they need via screen mapping, online query and online report generation—again, without programmer involvement.

You'll increase productivity with CA-UNIVERSE significantly. With no loss of performance. And in virtually any hardware environment, since it's completely portable.

You owe yourself a demonstration of the efficiencies this new Computer Associates product can bring you. Contact your local Account Manager. Or call 800-645-3003. In NY: (516) 333-6700.



COMPUTER ASSOCIATES

COMPUTER ASSOCIATES INTERNATIONAL INC.
125 Jericho Turnpike, Jericho, NY 11753



'ADC' Manages Software Info

CONCORD, Mass. — Software Maintenance & Development Systems, Inc. has announced a package that manages software and information about software in a data base.

The product, called Aide-De-Camp (ADC), is available on Digital Equipment Corp. VAX-11 computers running on the Unix operating system.

The package offers on-line interactive information and change management facilities, a spokesman said. It is said to reduce development time and decrease disk storage requirements.

ADC can be used to develop software written in any language. The system maintains software sources and all changes to that software in a data base, the spokesman said. Changes are treated as logical units, which can be added to or subtracted from a named base version. New versions can serve as base versions for future development.

Information management facilities capture and maintain information on named entities, code, changes, versions and external documentation.

A single-site license costs \$42,000 from Software Maintenance & Development Systems through P.O. Box 555, Concord, Mass. 01742.

On-Line Documentation Facility Featured Release 1.2 of 'Magec' Out for OS, DOS Users

DALLAS — Al Lee & Associates, Inc. has announced Release 1.2 of its Mask and Application Generator and Environment Controller (Magec) application generation software for IBM OS and DOS operating environments.

The new release features an on-

line documentation facility which is primed with user instructions for all the system's Magec functions and permits the user to enter and maintain an unlimited amount of documentation. The company claimed that the facility eliminates the need to write most documentation and

that updates to the on-line documentation are instantly available to all users. A cross-referencing scheme eliminates the need to key the same information repeatedly for similar or related topics, the spokesman noted.

The software monitors what the operator has been doing, any error messages received and misentries of key information. All entry and maintenance to the on-line documentation may be done on-line, and all text is stored on a system file.

Magec includes screen painting, Cobol program generation, on-line security, message compression and nonprocedural specifications entry. The product requires IBM's CICS or Applied Data Research, Inc.'s Datacom DC and supports a variety of data base management systems.

The price is \$28,900 plus \$7,500 for an optional report spooling feature from 2324 Seedling Lane, Dallas, Texas 75252.

Integrity Update Said to Speed Failure Recovery

ENGLEWOOD, Colo. — Integrity Solutions, Inc. has announced the Shadow File Processing feature, an enhancement to the firm's Data Recovery System (Integrity/DRS) for users of IBM systems software.

The Integrity/DRS package will run on any IBM 370 series or compatible processor using the OS/MVS, OS/VS1 or DOS/VSE operating systems. Shadow File Processing is said to provide faster failure recovery for installations which cannot tolerate disruption of its on-line network while Vsam files are being recovered. This feature reportedly maintains "warm" copies of critical on-line files, which can be maintained on either the same CPU, a different CPU or a remote processor.

Users can periodically apply journal records to a disk-resident Shadow File which is kept current at user-specified intervals. Therefore, if the installation's primary IBM Vsam file becomes unusable, the Integrity/DRS user can apply the last set of newly created journal records to the Shadow File. This process makes the Shadow File ready for use with minimum disruption to the firm's critical on-line environment.

Integrity/DRS, which now includes the Shadow File Processing feature, gives computer installations the ability to recover Vsam or Isam records or entire files.

The package costs \$15,000 for OS/MVS, \$12,000 for OS/VS1 and \$8,000 for DOS/VSE. Integrity Solutions said from 7351 E. Hinsdale Court, Englewood, Colo. 80112.

Zip Code Attachment System Produces Nine-Digit Codes

LOMBARD, Ill. — List Processing Co. has announced Zip Code Analysis Program (ZAP-9), a nine-digit Zip Code attachment system which automatically determines the U.S. Postal Service delivery sector and segment for any address in a specified five-digit area.

ZAP-9 affixes the appropriate four digits to each five-digit Zip Code and verifies any nine-digit Zip Code on file, a spokesman said. A segment can designate one side of a street between intersections, both sides of a street between intersections, a firm, a building or firm within a building or one or more floors within a building. In an IBM MVS batch processing environment, ZAP-9 can process up to one million addresses per hour, the

spokesman said. The product runs on IBM OS/VS and DOS/VS-compatible operating systems using IBM Vsam files. The price ranges from \$9,900 to \$29,900 from List Processing at 555 Waters Edge, Lombard, Ill. 60148.

DOS, OS, VS Users Offered 'CA-General Ledger' Package

JERICHO, N.Y. — Computer Associates International, Inc. has announced the availability of its interactive general ledger package, CA-General Ledger, for IBM DOS, OS and VS users.

CA-General Ledger has on-line ca-

pabilities coupled with real-time processing, a spokeswoman said. The package is a complete accounting, budgeting and reporting system. User-defined account number structures, fiscal years and accounting periods are available. Data entry, validation and inquiry is on-line. A report generator allows creation of an unlimited number of custom reports with simple commands, the spokeswoman said.

The package can be integrated with other CA financial management products, including accounts payable, accounts receivable, asset management and financial planning and modeling. A single transaction is posted first to the relevant subsystem and then to the appropriate general ledger account.

CA-General Ledger is priced at \$52,000 for OS and VS users and \$48,000 for DOS users from Computer Associates International at 125 Jericho Tnpl., Jericho, N.Y. 11753.

VAX RESOURCE ACCOUNTING SOFTWARE

PACS™ is #1 in VAX™ Resource Accounting, Internal/External Billing and Chargeback, and Performance Monitoring... #1 because it serves more VAX installations than any other resource accounting software package. PACS is the only resource accounting package that has met the rigorous standards for acceptance in DEC's™ exclusive EAS library. In fact, you can even buy PACS directly from DEC, if you wish.

PACS provides much more than standard VAX resource reports. Extra features include flexible billing algorithms, user budgeting, efficient disk storage collection, port speed accounting, software/hardware tracking and an optional login enhancement—EZLOG!™ EZLOG allows users to specify projects during login, making it the only software available with true 3-level reporting by account, project and user. With EZLOG, you can even change projects without logging out.

Source code is provided for both PACS and EZLOG. Plus, STI gives you unprecedented support via toll-free telephone, TWX or mail. Go with the #1 Resource Accounting Software Package... PACS.

Write or call today for details.

Signal Technology, Inc.
5951 Encina Road
Goleta, CA 93117
(805) 683-3771

**Outside California, call
toll-free (800) 235-5787**

VAX and DEC are trademarks of
Digital Equipment Corporation



GUIDE TO SOFTWARE PRODUCTIVITY AIDS

A directory of software tools available commercially that will help to improve the productivity of your system development efforts.

- Over 400 products
- 20 classes
- Cross indexed
- Semi annual

- For System Development
- For the Information Center

The Guide is organized in such a way that you will be able to locate what you need quickly and easily, and product descriptions provide you with a concise explanation of what each package does.

Please send more details

NAME	TITLE
COMPANY	
ADDRESS	
CITY/STATE/ZIP	PHONE

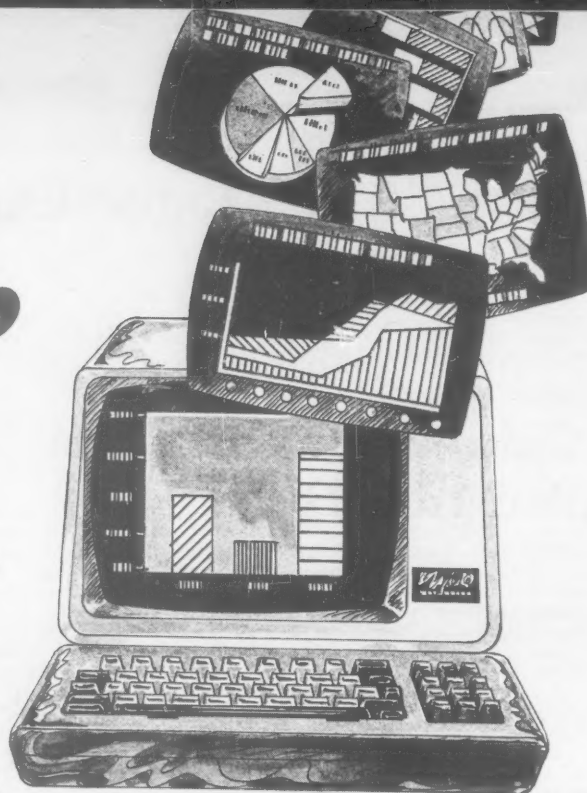
ACR

Applied Computer Research

P.O. BOX 92280 • PHOENIX, AZ 85068 • (602) 995-5929

Pages of printout, or one good graphic?

The applications are endless...



**Computerworld's July 25th Special Report
will give you the whole picture.**

You'll really get it all in *Computerworld* next month. This Special Report on Graphics Systems will give you all the information you need on the latest technologies, techniques and applications in the computer graphics market. You'll read what's happening in: • Emerging low-cost CAD • High quality graphics systems • Graphics terminals • Software • Developments in the output market • Boardroom graphics • Cost-cutting benefits/time savings for top-level executives.

You'll get applications stories on CAD, systems graphics and micros, business graphics, boardroom graphics and more. You'll get tutorials on presentation graphics vs. peer graphics, graphics in decision support systems — and more.

Our July 25th Special Report is designed to give you a valuable overview of how graphics are improving the communication and distribution of data — you can't afford to miss it.

And if you market graphics systems and equipment here's your chance to give *Computerworld's* half-a-million readers the story of how your products can put them in the picture. They'll be reading this Special Report July 25. The ad deadline is July 8. Call your *Computerworld* salesperson for all the details. Or, call Don Fagan, Vice President, Sales at (617) 879-0700.



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BOSTON/Chris Lee, Ed Marecki, Joe Fitzhugh, Jim McClure, Kathy Doyle, Diane Sukey, (617) 879-0700
CHICAGO/Art Kossack, Newt Barrett, Chris Lee, Jean Broderick, (312) 827-4433
NEW YORK/Mike Masters, Doug Cheney, Ray Corbin, Joan Daly, Fred LoSapio, Gale M. Paterno; (201) 967-1350
ATLANTA/Jeffrey Melnick, Mike Masters, (404) 394-0758
SAN FRANCISCO/Bill Healey, Barry Milione, Theodora Franson, A.G. Germano, Eileen Dunn, (415) 421-7330
LOS ANGELES/Jim Richardson, Bob Hubbard, Beverly Raus, (714) 556-6480

UCC-1 Tape Management Updated With Release 4.7

DALLAS — University Computing Co. has announced Release 4.7 of its UCC-1 Tape Management System.

The product runs on IBM 370 and plug-compatible mainframes under IBM's OS operating system. It includes an interface to UCC-9/R+, which was designed to help users remove bad tapes from their libraries.

The new version includes a scratch subpool function that permits users to divide their scratch tape pools into subpools that are relevant to their operation. Subpools can be based on the tapes' location in the library, physical characteristics of the tape or the intended use of the tape volume in the subpool, a spokesman said.

Other enhancements in-

System/38 Gets Tool From Trisys

SHREWSBURY, Mass. — Trisys, Inc. has announced a Resource Account Management and Statistical Exception System (Rames) as part of its series of IBM System/38 operational, documentation and conversion tools.

Rames comprises four major subsystems offering a historical job data base, resource data collection, storage allocation management, resource utilization graphing, detail and summarization job reporting, cost center management and job exception reporting.

Engineered for the System/38 object-oriented architecture, Rames costs \$750 from Trisys through P.O. Box 274, Shrewsbury, Mass. 01545.

clude improved general report writer capabilities, extended on-line security for password-protected volumes, production of external labels through the tape inquiry mode and expanded audit trail tracking.

Release 4.7 of UCC-1 costs \$21,500 from University Computing, UCC Tower, Exchange Park, Dallas, Texas 75235.

Release 2.1 of Netman Package Boasts Over 30 Additional Features

SANTA MONICA, Calif. — California Software, Inc. has announced Release 2.1 of its Netman data center and data communications management package for IBM mainframes operating under the DOS, DOS/VSE, OS/VS1 and MVS operating systems.

Netman provides on-line facilities for configuration, problem, change and finan-

cial management.

Release 2.1 includes more than 30 additional features including: Netman-driven electronic mail (with a facility for delaying delivery of user-defined messages at a prespecified future date), problem broadcasting (with a facility for reprinting trouble tickets periodically until the problem is resolved), on-

line reporting and mass copy or transfer of actual or prototype configurations.

Release 2.1 is available to current Netman users at no additional charge. Netman costs between \$14,500 and \$32,500 depending on operating system and options. California Software is located at Suite 304, 1460 4th St., Santa Monica, Calif. 90401.

Cut the cost of data communications with the last word in statistical multiplexers.

Only \$68 a month.

COMDESIGN'S NEW TC-500.

Introducing the quickest way to cut costs.

With the TC-500, you need just one line for up to 32 remote terminals—without sacrificing throughput. Automatic error control, network statistics and diagnostics are provided as a bonus.

SIMPLY SOPHISTICATED.

ComDesign's touch panel and "ordinary English" display (or optional Executive Port) are as easy to use as your CRT. User-friendly engineering is combined with next-generation technology to give you the simplicity you want and the sophistication you need.

BUILT-IN FLEXIBILITY.

Compatible with virtually any host computer, the TC-500 supports synchronous and asynchronous terminals at all popular

with very attractive quantity discounts. And, in the unlikely event that you will ever need it, you can count on ComDesign's FastFix service for over-

speeds. It even handles special character formats, a wide variety of flow control conventions, speed conversion, and split speeds to guarantee flexibility in today's changing datacom networks.

TC-500's unique display gives you immediate access to program, network and diagnostic information for up to 32 synchronous or asynchronous channels.

POWER, EFFICIENCY AND CONTROL. ComDesign's multi-processor architecture provides extraordinary throughput and fast echo. The dual data link option brings the added security and efficiency of a second composite link. And TC-500 monitoring and diagnostics, with visual display of channel data, EIA signals, error counts and utilization statistics, are right at your fingertips.

PRICEWISE.

The TC-500 starts at \$1700 for a 4-channel unit,

night unit replacement. Call today toll free 800/235-6935 (in CA 805/964-9852) or send for a TC-500 brochure and discover how simple it is to put phone bills back in line.

SEND ME THE LAST WORD

ComDesign, Inc.
751 South Kellogg Ave.
Goleta, CA 93117
Call 800/235-6935

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____

PHONE _____

ComDesign

Cutting the cost of data communications.

CW 7/4

ALUMINUM MAG TAPE REEL CASES

ships up to 18 reels in strong lightweight case



#5125
1 to 10 Canisters
#5126
1 to 14 Thinline
#5127
1 to 18 Tapesel



#5110
1 to 5 Canisters
#5115
1 to 7 Thinline
#5120
1 to 9 Tapesel

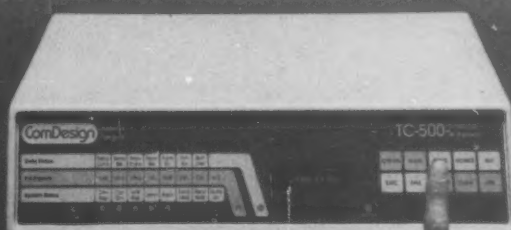
See your local dealer, or call/write—

ALUMINUM CASE CO.

DIVISION OF BY-LO MFG., INC.
3333 W. 48th PL. (312) 247-4611
CHICAGO 60632



ComDesign's TC-500 Statistical Multiplexer. Dollar for dollar the competition can't touch it.



TOLL FREE (800) 235-6935

End-User Training Seen Key Support Function

(Continued from Page 29)
and today more than 900 TSO users work on the system. Separate training classes are held for DP personnel and end users, and completion of a special TSO class is mandatory before new users can enroll in other DP classes.

"The training department and MIS work together on a training development team to design the materials and

presentation format for each course," said time-sharing coordinator Lee Donaldson. Classes in the Atlanta-based training center include both lectures and hands-on workshops. Recently, the firm began to experiment with outside consultants/instructors for classes in Focus, SAS Institute, Inc.'s SAS and Execucom Systems Corp.'s Interactive Financial Planning System.

According to Donaldson, the "outside instructors ensure a professional course design and consistent quality. They also can be counted on to make certain all course materials are kept up-to-date to include important new product features."

Experience in end-user training has led Coca-Cola to develop the following internal criteria for a successful end-user training program:

- Adequate facilities and terminals with no more than three students using each terminal.
- Quality instructors either in-house or outside.
- Enough workshops to provide fundamental understanding of material.
- Complete handouts and manuals.
- Active technical support after training.

A centralized support

group provides hot-line support to users, and a semiannual "TSO Update" newsletter is issued.

In sharp contrast to RCA and Coca-Cola, much of the end-user training function has been eliminated at the Equitable Life Assurance Society in New York, according to senior project manager Larry Brendler. Although products like Focus and SAS are heavily used by nontechnical end users there, the Equitable systems department has created a front-end system facility to allow users to write simple report requests without product-specific training.

The internal system, called Manager's Workbench, includes prompts that guide the user through "yes" and "no," fill-in-the-blank and multiple-choice questions.

"We hold a somewhat different view of end-user training because we feel nontechnical people don't really want to learn to use a language, even the most simple of languages, if they won't be using it on a regular basis," Brendler said. "We feel a large population of our users are infrequent users who really wouldn't benefit from knowing all the details even if they wanted to learn them."

Manager's Workbench is somewhat limiting, according to Brendler, but when users want additional capabilities, they are sent directly to off-site vendor training classes.

Mantis Gets DL/1 Access

(Continued from Page 29)
line. In addition to DL/1 files, the Mantis logical view provides access to Cincom's Total Information System and Total data base files and to IBM Vsam files.

The Mantis-DL/1 Access Logical User View is separated into the DL/1 Access Design Facility and the DL/1 Call. The DL/1 Access Design Facility is said to allow the data base administrator to define the structure of the data base segments to be used. The DL/1 Call consists of an interface statement that is used to define the interface area and a call statement that handles communications with the DL/1 Access Logical User View.

The DOS and OS versions of Mantis-DL/1 Access Logical User View can be purchased for \$9,950. Leasing plans also are available, the vendor said from 2300 Montana Ave., Cincinnati, Ohio 45211.

**PROGRAM
MAINTENANCE.**
**IT'S AN IDEA
WHOSE TIME
HAS GONE.**

Most application programmers should really be called maintenance personnel: 60 to 80 percent of their time is consumed making "quick" patches. While the applications development backlog steadily mounts.

Fortunately, users of Microdata computer systems have a way to break the logjam: ALL[®] The Application Language Liberator.

ALL users define their applications on a series of menu-driven input screens. While ALL automatically builds the application from a comprehensive set of debugged, machine language building blocks.

ALL handles labeling, format definition and documentation according to predefined standards. So update and maintenance time is slashed dramatically. (Even when the original programmer has moved on.)

ALL cuts new application development that once took months down to a few days work. Major applications involving complex file structures, multi-level input screens, multiple report formats, menus, utilities, detailed math and logic functions, and security access provisions can be developed easily using the ALL system.

Imagine! Less maintenance. Automatic documentation. Faster development. Bye-bye backlog.

For more information on an idea whose time has come, write Microdata Corporation, P.O. Box 19501, Dept T-208, Irvine, CA 92713.



Microdata
SIMPLY POWERFUL



Microdata is a subsidiary of McDonnell Douglas Corporation.
© 1983

For Public Data Network Protocols Progress Seen Likely in Standardization

By Phil Hirsch

CW Washington Bureau

BOSTON — Substantial progress is likely this year and next in standardizing protocols for public data networks, according to T. B. Steel of American Bell, Inc. Steel was the leadoff speaker at a standards session during the recent International Conference on Communications held here by the Institute of Electrical and Electronics Engineers.

The session focused on the Open Systems Interconnection (OSI) model, a draft standard proposed by the International Standards Organization (ISO), which Steel defined as a "logical construct describing what should be standardized and where" to permit communications between "application processes" — typically, programs — lodged within terminals and computers linked via one or more networks.

The OSI model consists of seven layers; each is intended ultimately to form the basis for a set of standards. Level 1 involves a terminal and its associated modem, and Level 2 is concerned with the data link typically connecting a terminal with a network node.

Higher levels of the model define the functions that have to be standardized to provide communications between the terminals and processes at the extremities of a network-based message path.

The main result of the OSI standardization effort to date is X.25, which provides one implementation of the first three OSI levels. X.25 was developed by the Consultative Committee on Data (CCITT).

(Continued on Page 38)

AT&T Service to Link Users Through Touch-Tone Phones

By Phil Hirsch

CW Washington Bureau

BOSTON — A computer-controlled teleconferencing service that interconnects participants through Touch-Tone telephones was one of the new offerings AT&T discussed here at the recent International Conference on Communications, sponsored by the Institute of Electrical and Electronics Engineers. The company also talked about plans to increase the transmission capacity of its satellite network.

The new teleconferencing system will be based on a computerized Network Services Complex (NSC) which allows an audio conference to be established automati-

cally. The conference originator will call the NSC, which is physically connected to a No. 4 ESS network switch. In response to recorded audio prompts received from the NSC, the originator will then input the telephone numbers of the individuals he wants included in the teleconference.

AT&T currently offers a similar service, but it requires a human operator and has extremely limited ability to accommodate graphics terminals. The new system reportedly can interconnect any device that complies with the Consultative Committee on International Telephone and Telegraph Group IV facsimile protocol.

According to Peter Nash, a Bell Laboratories engineer who helped develop the system and described it at the conference, AT&T's Long Lines Division plans to tariff the new teleconferencing system in September.

The NSC "has been designed for initial support of several capabilities," Nash added. One such capability is Extended 800.

(Continued on Page 40)

Communicating Terminal Input Sought for CW Special Report

Computerworld is looking for a few good stories on data communications terminals. An Aug. 29 Special Report is now in the making, and contributions should be received by July 11.

Stories may take two forms:

- Tutorials covering a trend or direction in data communications terminals. For example, how will data communications terminals compete with personal computers? What are some new uses of these terminals? Who should be given such a terminal? Can noncommunicating terminals be upgraded for networking?

- Case studies of users who have solved specific business problems with certain types of data communications terminals.

Both vendors and users are invited to submit articles written in the third person, but no story that is only a product endorsement will be accepted.

Articles should be between four and six double-spaced typewritten (no dot matrix) pages in length. Authors are encouraged to include any camera-ready art of charts or graphs and black-and-white photographs pertaining to the article.

Please include with all submissions a very brief biography of the author (name, title, company, city, state) and a telephone number at which he can be reached. Articles should be sent to Jim Bartimo, Computerworld Editorial Department, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Northern Telecom Cuts CRT Price Tag

MINNEAPOLIS — Northern Telecom, Inc. has announced a 19% price reduction for its Displayphone 100 terminal.

Listed now at \$1,295 for domestic sales, the desktop combination telephone and data terminal simultaneously transmits and receives voice and data communications.

The Displayphone 100 features a retractable keyboard and display screen, a spokesman said.

More information is available from Northern Telecom at Data Park, Box 1222, Minneapolis, Minn. 55440.

300 BAUD
103A COMPATIBLE



\$147

☐ MODEL 305E2-12

☐ Acoustic Couplers ☐ Models ☐ Line Drivers ☐ Accessories
☐ Statistical Multiplexers ☐ Protocol Converters

ComDATA

We can get you there from here. 312/470-9800

Please check items of interest and return to us for additional information

7900 N. Nagle

Morton Grove, IL 60053

New York

212/690-7727

Los Angeles

213/622-0334

member of

ICDMA

MODEMS

WITH ALL THE FEATURES YOU NEED

FULL DUPLEX • EIA RS232C INTERFACE

INTEGRAL VOICE / DATA SWITCH ALLOWS
USE WITH ANY MODULAR TELEPHONE

CAN BE USED ON DIAL NETWORK
OR TWO WIRE PRIVATE LINES

212A HAS MANUAL ORIGINATE / ANSWER
SWITCH; 103A IS ORIGINATE ONLY

1200 BAUD
212 A COMPATIBLE



\$377

☐ MODEL 212E2-32

name _____
company _____
street _____
city _____ state _____ zip _____
telephone _____ ext. _____

Warranty On Monitors Extended

SALT LAKE CITY, Utah — Questronics, Inc. has announced the extension of the warranty on the company's Model CPA/7 data communications monitors from three months to three years.

The Model CPA/7 monitors data communications lines for IBM's Binary Synchronous Communication or Systems Network Architecture/Synchronous Data Link Control protocols.

The CPA/7 reportedly evaluates system performance by monitoring a line and providing a hard-copy printout for analysis. The unit measures response time, number of transactions and line utilization. It also offers raw data dump for data basing and retentions of all parameters during power interruptions.

The extended warranty covers parts and labor as well as upgrades that may occur during the three-year period.

The monitor is priced at \$7,500. More information is available from the vendor at 3565 S.W. Temple, Salt Lake City, Utah 84115.

Tri-Data Offers Z80-Based Processor

MOUNTAIN VIEW, Calif. — Tri-Data Corp. has announced the OZ 228, a programmable communications processor based on the Zilog,

Inc. Z80 microprocessor.

The OZ 228 is equipped with an integrated Bell 212A intelligent modem. In addition to the base 212A modem

functions, users and systems integrators can develop their own application programs for most storage, data entry communications or network requirements, the vendor said.

The unit reportedly can improve operator productivity and network flexibility by reducing the load on host processors, workstations and communications lines, the vendor said.

In addition, the OZ 228 includes all the features of Tri-Data's OZ 225 intelligent network modem, including automatic dialing and logon,

speed buffering, flow control and dial directory maintenance.

The OZ 228 contains 64K bytes of dynamic random-access memory (RAM), expandable to 128K bytes, 2K bytes of Cmos RAM and three 8K-byte electronically programmable read-only memory chips, the vendor said.

The OZ 228 will be available in August and costs \$1,590 for a 64K-byte RAM configuration. The 128K-byte version costs \$2,060, Tri-Data said from 505 E. Middlefield Road, Mountain View, Calif. 94043.

CDS Lowers Price by \$700 On Full-Duplex Modem

WALTHAM, Mass. — Concord Data Systems, Inc. (CDS) has lowered the price

of its CDS 224 2,400 bit/sec full-duplex modem by \$700.

Capable of operating in both synchronous and asynchronous modes, CDS 224 reportedly doubles the throughput of 1,200 bit/sec full-duplex dial modems and reduces 2,400 bit/sec half-duplex modem turnaround time.

An automatic, 1,200 bit/sec fallback mode allows a centrally located CDS 224 to accept data from modems transmitting at either 1,200 or 2,400 bit/sec by adjusting itself to the speed and modulation of the incoming call, a vendor spokesman said.

The CDS 224, which supports most half- and full-duplex protocols, costs \$995, down from its previous price of \$1,695. CDS is located at 303 Bear Hill Road, Waltham, Mass. 02154.

PT14 Boasts Alternative

SANTA MONICA, Calif. — GR Electronics, Ltd. has unveiled the PT14, said to be a portable, low-cost alternative to the conventional desktop terminal.

The PT14 reportedly offers a convenient method of controlling and interrogating computer systems. It has a 40-key, positive tactile-response keyboard; 32-char. memory; an RS-232/20 mA interface; and 300/110 bit/sec transmission rates.

The PT14 costs \$425 from the vendor at 1640 Fifth St., Santa Monica, Calif. 90401.

Speaker Sees Real Progress For Protocols

(Continued from Page 37)
tative Committee on International Telephone and Telegraph (CCITT), an association of the world's telecommunications administrations. It is one of two major sources of international standards; the other is the ISO.

CCITT and ISO are "actively working" on another network standard to complement the one incorporated into X.25, according to a paper included in the conference proceedings, but details concerning the status of this effort were unavailable because the author, Christine Ware, of GTE Business Communication Systems, Inc., was unable to attend.

At the session on standards, Richard Gillman of Bell-Northern Research Ltd. reported that standards for the fourth (transport) and fifth (session) layers of the OSI model are both likely to be adopted in final form by the end of next year. Draft versions of both standards are now being voted on by members of the ISO, he said, and CCITT is not far behind.

Gillman expects drafts of CCITT recommendations covering the transport and session layers to be adopted early next year.

FLOW_Calc™ THE VAX spreadsheet calculator

\$3500

to try it yourself, call:
800-235-6788 (in California, call 805/964-7724 collect)
TWX/TELEX 910-334-1193

The Software Workshop®
GENERAL RESEARCH CORPORATION • A Flow General Company
5383 Hollister Avenue • Santa Barbara, California 93111

introducing Dial-Up 3270

LineMaster
An intelligent device for dial-in access to your mainframe 3270 line.

LineMaster is a communications watchdog which keeps a line in service until a user dials in.

- For any remote 3271/4/6 line, up to 19.2K baud.
- Compatible with any 3270 emulator including microcomputers.
- Connects between modem and mainframe.
- Installs in minutes.

\$639.

MF Microframe, Inc.
205 Livingston Avenue
New Brunswick, NJ 08901
(201) 828-4499

9600bps MODEM \$167.*

If you just want to run your data down the hall, or down the street, then the Z9600 Series of Short Haul Modems are just what you need.

Up to 9600 bps. up to 10 mile range, self test, transmit and receive indication, and optional rack mount version.

Want more information? Call or write us now for a data sheet and complete pricing. (We have generous discounts for quantity buyers).



37490 Glenmoor Drive
Fremont, CA 94536
415/794-7400
*Single Unit Price

GOT QUESTIONS ABOUT XA?

- What's new in channel architecture?
- 24-bits vs. 31-bits?
- How will it affect you?

MVS/XA WORKSHOP

4 Days — Tuition — \$750.00

9/6 thru 9/9 10/4 thru 10/7
11/8 thru 11/11 12/6 thru 12/9

ALSO...

MVS System Fundamentals — 10 Days — 10/17-10/28 — \$1900
MVS Structure and Flow — 10 Days — 9/19-9/30 — \$2200

To enroll, or for further information on other classes, or on-site education call Chris Johnson:
(303) 673-5151, x7415 or x7423



**Storage Technology
SOFTWARE EDUCATION**
1685 38th Street
Boulder, CO 80301



"I KNOW IT BELONGS TO YOU, BUT IT'S STILL NOT A PERSONAL COMPUTER."

**Personal computers
in the office —
personal or computers?
Read the next issue of
*Computerworld OA!***

COMPUTERWORLD
OA
OFFICE AUTOMATION

SALES OFFICES:

BOSTON/Chris Lee, Ed Marecki, Joe Fitzhugh, Jim McClure,

Kathy Doyle, Diane Sukey, (617) 879-0700

CHICAGO/Art Kossack, Newt Barrett, Jean F. Broderick,

Chris Lee, (312) 827-4433

NEW YORK/Mike Masters, Doug Cheney, Ray Corbin,

Joan Daly, Fred LoSapio, Gale M. Paterno, (201) 967-1350

ATLANTA/Jeffrey Melnick, Mike Masters, (404) 394-0758

SAN FRANCISCO/Bill Healey, Barry Milione, A. G. Germano,

Theodora Franson, Ruth Gordon, Ellen Dunn, (415) 421-7330

LOS ANGELES/Jim Richardson, Bob Hubbard, Beverly Raus,
(714) 556-6480

Personal Computers? Micros? Desktops? Call them what you will, they are all integral parts of your OA strategy. The personal computer phenomenon must be analyzed and tracked if it is to be used effectively. In the next OA Focus section of *Computerworld OA*, we'll examine how personal computers will affect new and experienced computer users, their work habits and staff requirements. We'll look at management strategies, user experiences and key product offerings. Users who have lived through the process will suggest methods to tie personal computers into a total organizational network or to keep them as personal data bases. And, we'll have an update on information centers.

In this issue, we'll also have an interview with author Alvin Toffler as well as articles on subjects such as information systems, measuring productivity, data base management systems and a productivity study on electronic mail.

Computerworld OA keeps you current on all aspects of office automation with coverage of both state-of-the-art technology and just-developing trends of the future. And every issue of *Computerworld OA* takes a closer look at a key issue in the OA Focus.

If you're involved in OA planning and decision-making, you'll want to read the next *Computerworld OA*.

New issue date: August 17th.

Advertising close is July 13th. (Materials due July 15th).

For advertising information on *Computerworld OA* and the people who read it, call Don Byrnes, National Accounts Manager at (312) 827-4433, or contact your local *Computerworld* sales representative.

Computerworld OA:

We're writing the book on office automation.

MCI International To Cut Telex Costs

RYE BROOK, N.Y. — MCI International has announced a plan to reduce the cost of the international component of telex calls by 10% to 25%. The discounts are available to MCI customers and customers of other carriers, including ITT, RCA Corp. and Western Union.

Based on their increased international telex traffic, customers will receive discounts beginning the effective date of the tariff, according to a vendor spokesman. Customers who had no MCI traffic in January will receive discounts on all MCI International billings for a 90-day period.

More information is available from MCI at One WUI Plaza, New York, N.Y. 10004.

With Lightning Suppressors Line Expander, Converter Offered

ATLANTA — Computer Peripheral Systems, Inc. has announced a Burroughs Corp. two-wire direct interface (TDI) Line Expander and RS-232 converter with lightning surge suppressors for indoor/outdoor operation.

The Ex-Con is available in three models: Model I is configured as a TDI line expander that will reportedly expand the capability of a fully configured TDI line.

Model II is configured as an asynchronous RS-232-to-TDI converter said to enable asynchronous RS-232 Burroughs terminals, modems or micros to operate on TDI lines.

Model III is a dual-mode unit said

to combine the capabilities of the Model I Expander and the Model II Converter into one unit to permit simultaneous operation of RS-232 and TDI devices on expanded lines.

Model I costs \$225; Model II costs

\$195; and Model III costs \$275. The lightning surge suppressors are an extra \$25 per outdoor TDI port. Computer Peripheral Systems can be reached through P.O. Box 98282, Atlanta, Ga. 30359.

Teleconferencing Service From AT&T Studied at Meet

(Continued from Page 37)

service, which Long Lines is expected to offer before the end of this year. The service will allow incoming calls to a given recipient to be

automatically routed to any of several locations, depending on the location of the calling party, time of day and other variables.

A typical use of Extended 800 service, Nash explained, would be to connect a stranded motorist to a nearby garage. The system would choose the garage after determining the caller's location by sensing the area code and number of the telephone he was using.

Another possible application would enable a traveling salesman to receive calls at each of several pre-specified locations.

In a paper entitled "The Changing Role of Satellites in AT&T's Communications Network," Robert F. Latter of Long Lines reported that the company is studying the use of Companded Single Sideband (CSSB) transmission on its new Telstar 3 satellites, the first of which are scheduled to be launched this month. Employing CSSB instead of conventional FM modulation on a satellite can increase its capacity from 1,800 voice-grade circuits to 7,800, Latter said.

He also reported that "we are gradually shifting away from use of our domestic satellite system for the shorter [Continental U.S.] circuits. As transponders are sold for TV or wide-band data, the shorter telephone message circuits are being shifted to terrestrial facilities. Our long-range plan is to continue [this process] with the possible exception of the longer routes."

CRT Emulations Out for Softerm

MEMPHIS, Tenn. — Softronics, Inc. has released five block-mode terminal emulations for Softerm, the vendor's high-speed CRT terminal emulation program for Apple Computer, Inc.'s Apple II and IIe computers. The new terminal emulations include the IBM 3101 Model 20, Honeywell, Inc.'s VIP7205, Televideo Systems, Inc.'s 925 and Hazeltine Corp.'s 1520.

Softerm reportedly operates on the Apple II and IIe to provide an exact look-alike for 20 popular CRT terminals used to access applications on host computers and time-sharing systems, according to a spokesman for the vendor.

The Softerm terminal emulation program, including a 300-page user's guide and terminal emulations for about 21 models from 10 vendors, is available for \$150 from Softronics, 6626 Prince Edward Place, Memphis, Tenn. 38119.

Learn more about Personal Computing, Office Automation or Communications in these video journals from CW Communications and Deltak.

Personal Computing:

A Business Perspective

Taped on location during CW Communications' COMPUTERWEEK conference, these six video sessions feature many of the biggest names in the microcomputer industry as they share their insights into the application of personal computers in the business environment. Each of the six tapes is 20-30 minutes long, and focuses on a specific issue. Available through Deltak singly or as a group.

- Thinking Small for Big Business
- The Purchase Decision
- Finding a Vendor
- Sales Trends and IBM
- New Languages and Networking
- A Look Toward the Future

Office Automation: The Essential Issues

Last Fall, executives from around the country attended the OA Forum, a national conference conducted by CW Communications on the introduction, integration and implementation of office automation in today's business environment. Leading industry experts and top corporate managers discussed key office automation planning issues. These discussions are now available to you in seven carefully edited conference journals. Each journal is in full color, and 20-30 minutes long. They are available from Deltak singly or in a group.

- The DP Role in Office Automation
- Planning for Office Automation
- The Fundamentals of Integration
- Some Specifics of Integration
- The Executive Workstation
- One Company's Experience
- Introducing Office Automation to Your Organization

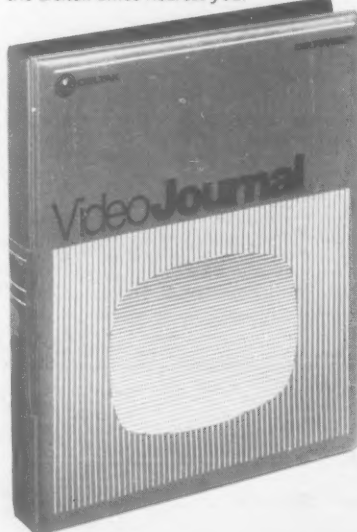
Communications

Leading experts in all areas of communications were recently taped at the 1983 Communication Networks Conference in New Orleans. The result was two brand new video conference journals of

key interest to all levels of corporate and technical understanding:

- Communication Networks: Alternatives for the 80's
- Local Area Networks: The major considerations

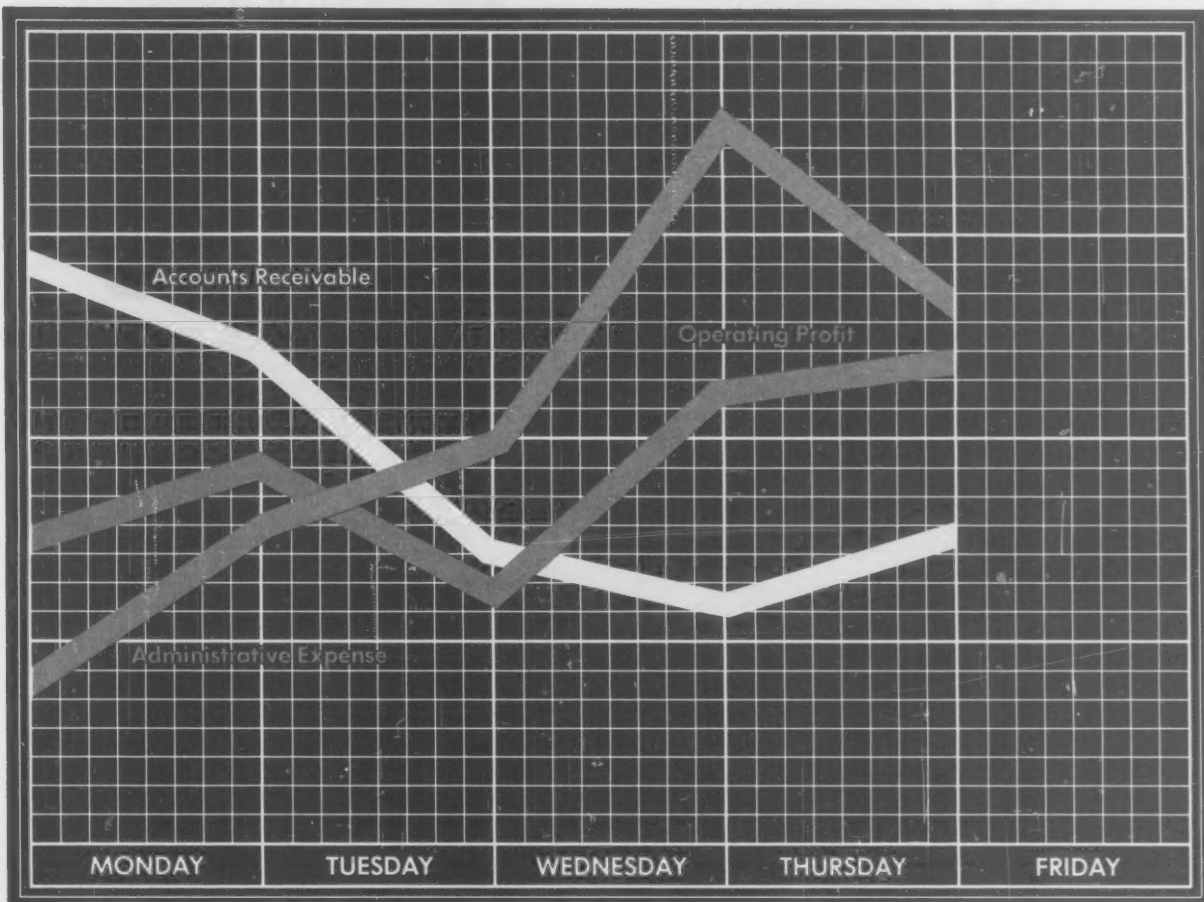
All of these useful journals are available through Deltak, Inc., 1751 Diehl Road, Naperville, IL 60566. To get more information, or to find out about rentals, just call Deltak Order-Entry at (312) 369-3000 (in Canada, (416) 678-9222), or check the white pages of your telephone directory for the Deltak office nearest you.



CW COMMUNICATIONS/INC.

Publishers of Computerworld, InfoWorld, PC World, ISO WORLD, and other leading computer publications around the world.

In these fast-changing times, it pays to know where you stand.



You understand better than anyone the importance of knowing where your company stands at the end of the month. The start of the week. Even the middle of a Thursday afternoon.

Because you want to have time to act. Not react.

And we have just the solution: the HP 3000 business computer with financial accounting. It's a sophisticated, on-line, interactive system that gives you and your company the capabilities you need to make more informed decisions. To manage cash resources. To be more successful.

A comprehensive financial package.

HP Financial Accounting integrates general ledger functions with accounts receivable and accounts payable capabilities,

automated allocation of expenses and tools that let you customize everything from reports to the way you use the computer.

Which means you can format both the screen and reports to give you the information you need—any way you want it. Including on-line reviews.

Do you operate internationally? HP Financial Accounting has sophisticated multi-national features. Screens and documentation in a variety of foreign languages. Dual ledger and currency capabilities. Multiple tax formulas.

The right computer, too.

HP Financial Accounting software runs on the HP 3000: a computer that understands the special demands of the interactive user. There is a range of models, all with complete software compatibility. You can buy what you need now, then add more as you grow.

They work together with the software

to keep things simple. There's always a menu of choices so your staff never has to memorize complicated commands. And a single keystroke allows instant access to help screens.

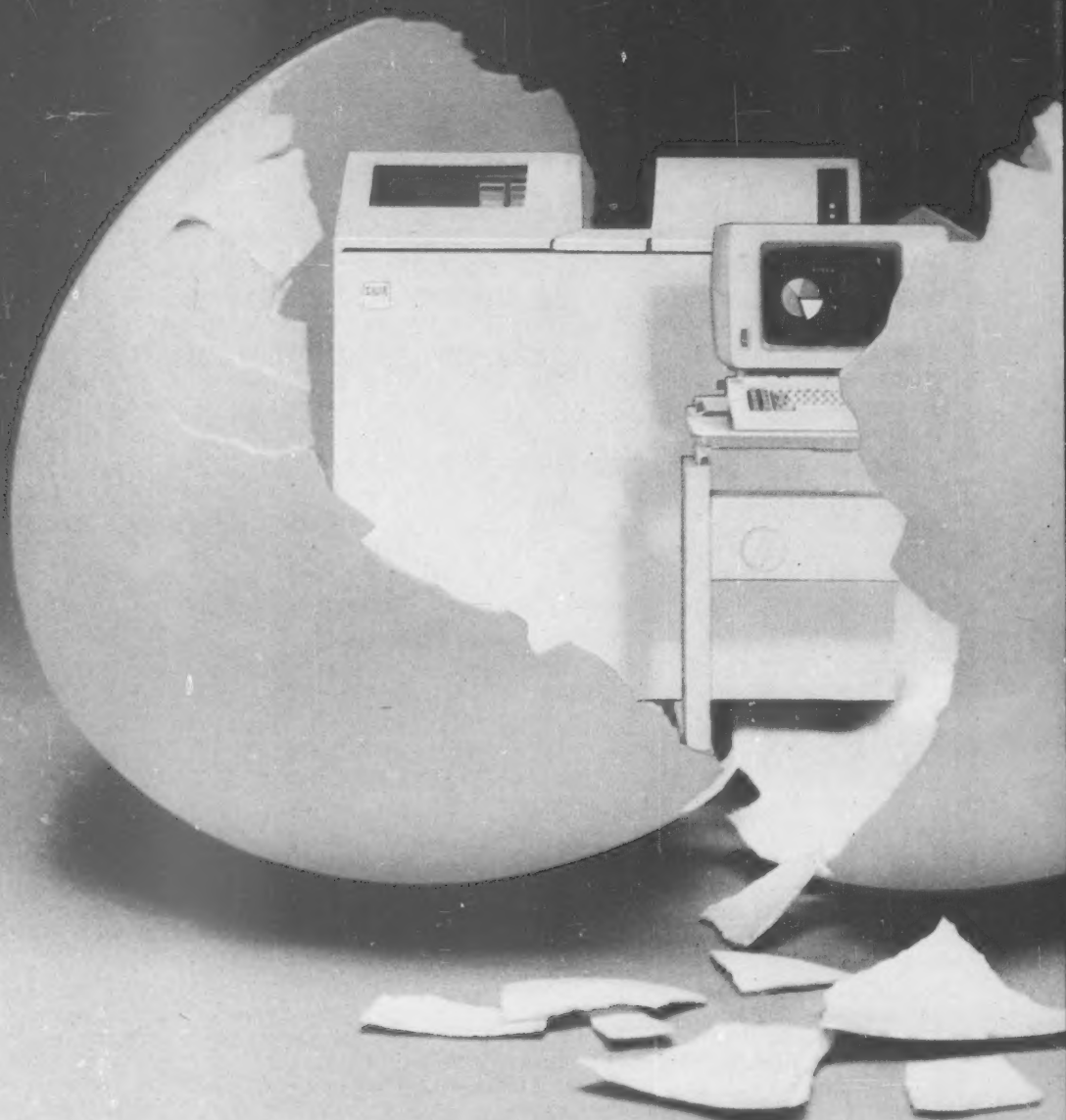
Best of all, you get the benefit of Hewlett-Packard's long history of data processing experience. Support through application centers across the country. And worldwide service and training.

Exactly the kind of company you need behind you. Every day of the week.

For more information, call or write Tim Haney at Hewlett-Packard, Dept. 03182, 370 West Trimble Road, San Jose, CA 95131. (408) 263-7500.



**HEWLETT
PACKARD**



**New IBM System/36 uses
the strengths of our System/34.
And goes on from there.**

It's a new computer with even higher levels of performance than one of our most popular computers.

We doubled the memory, up to 512K bytes. Boosted disk storage up to 400 megabytes. Added a magnetic tape storage unit. Increased local work stations from 16 to 30, including color displays.

And the System/36 has available hundreds of software packages, covering most major industries. Many

are recompiled from programs that are already running on our System/34; others are the new system's own software, including office applications like text management, spelling check, local electronic mail and color graphics.

System/36 can operate stand-alone with as many as 64 remote work stations, among them the IBM Personal Computer. It can also work in a distributed processing network communicating with a large host or with other System/36s. And, if you're moving up from a System/34, your I/O investment is protected because virtually all of its peripherals are able to work on the new system.

What's more, System/36 is very friendly. Users are

Announcing a new computer people have been using for years.

guided by easy-to-understand menus. A HELP key simplifies things, even for first-time computer users. Another key lets them start over without having to retrace every step.

Extensive diagnostic features troubleshoot automatically, and even correct problems as you work.

It's one of the most thoroughly tested products we've ever made. We gave it the equivalent of a century of testing before we put it on the market.

And a new flexible Term Lease makes the System/36 easy to finance.

For a demonstration or free brochure call your local IBM sales office or our toll-free number, or send in the coupon.



IBM System/36

90

Write today to: IBM, DRM, Dept. IT3, 400 Parson's Pond Drive, Franklin Lakes, New Jersey 07417.

- ☐ Please send me a free brochure about the IBM System/36.
☐ I'd like a free demonstration of the IBM System/36.

NAME _____ TITLE _____

COMPANY _____

STREET ADDRESS _____

CITY _____ STATE _____ ZIP _____

BUSINESS PHONE _____

Call *IBM Direct* 1800 631-5582 Ext. 90.
In Hawaii/Alaska 1800 526-2484 Ext. 90.

Comdesign Introduces Its TM Series of Modems

GOLETA, Calif. — Comdesign, Inc. has introduced its TM series of modems.

The TM-1200 is a Bell 212A-compatible modem operating full-duplex asynchronous at 300 bit/sec, or full-duplex synchronous/asynchronous at 1,200 bit/sec over a two-wire dial-up circuit.

The TM-2400 modem reportedly provides antistreaming protection to eliminate network jams. Operating full-duplex synchronous at 2,400 bit/sec, the modem is reportedly compatible with Bell Laboratories 201B data sets.

The TM-4800 is designed for use in conjunction with the switched

telephone network or with two-wire circuits, providing full-duplex operation except in a two-wire network when it operates in a half-duplex mode, according to a spokesman for the vendor.

The TM-9600 is designed for four-wire operation in point-to-point configurations and includes self-test, analog, digital and remote digital loopback.

The 1200 and 2400 modems sell for \$750. The 4800 costs \$1,750 and the 9600 is priced at \$2,750, according to the spokesman.

More information is available from Comdesign at 751 S. Kellogg Ave., Goleta, Calif. 93117.

Teleterm Enhancements Out

WILLINGBORO, N.J. — Telexpress, Inc. has announced the release of Teleterm Version 2.0 and Teleterm-EM, a Teleterm terminal emulator software package.

Both integrated packages are said to combine the functions of word processing and communications into one product. In addition, Teleterm-EM reportedly provides the capability of emulating any terminal as long as the functions are supported by the microcomputer.

Teleterm-EM and Teleterm 2.0 are also said to feature supporting utilities under menu control; direct disk-to-disk file transmission between Teleterm systems; autotransmit messages up to 255 characters; and access to common time-sharing systems.

Pricing for Teleterm 2.0 on the IBM Personal Computer and Radio Shack TRS-80 Models II, 12 and 16 is \$165 and for the TRS-80 Model 4 is \$135. The price for Teleterm-EM is \$225 for TRS-80 Models II, 12, 16 and the IBM Personal Computer and \$175 for the Model 4. The firm can be reached through P.O. Box 217, Willingboro, N.J. 08046.

IDS Releases Selector Switch, 6200 Modem

LINCOLN, R.I. — International Data Sciences, Inc. has introduced a modem designed for asynchronous operation over private two- and four-wire nonloaded metallic conductors at speeds up to 19,200 bit/sec.

The Model 6200 limited-distance modems can be used in both point-to-point and multidrop network configurations and for local data distribution up to nine miles.

Features of the modem include internal strap selections for receiver impedance, receiver equalizer and two- or four-wire operation. The modem employs a baseband modulation scheme that varies the voltages of the transmit signal on a balanced line, according to the vendor.

The vendor also announced its Model 8506-D, A, B selector switch to the expanding Series 8500 Minitech desktop switching modules; the Model 8506-D is used to switch the 25-pin EIA RS-232 or CCITT V.24 interface to either of two outputs.

The modem is priced at \$250 and the selector switch costs \$175. International Data Sciences is located at 7 Wellington Road, Lincoln, R.I. 02865.

Data Test Set Offered, Aimed At Technicians

BEDFORD HEIGHTS, Ohio — Electrodata, Inc. has announced the CTS 1, a hand-held battery-operated data communications test set.

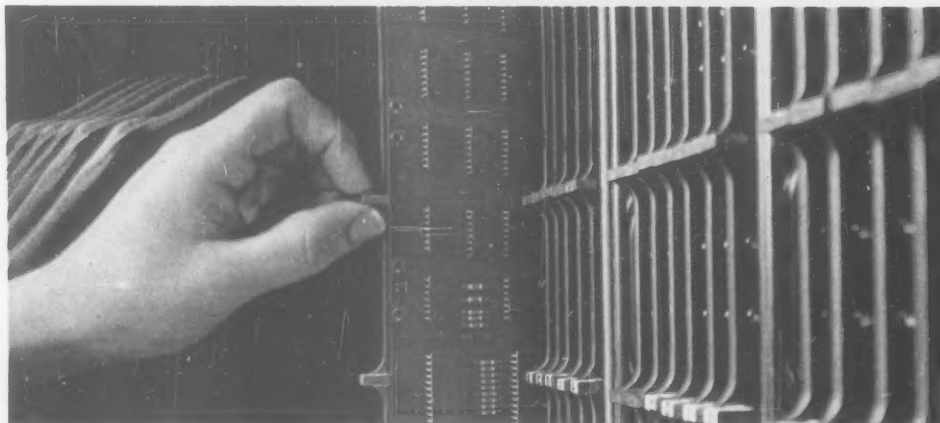
Designed for the first-line service technician in the data communications industry, the test set can be used with modems, multiplexers and data communications links. The CTS 1 will perform bit and block error-rate tests, bias distortion tests, count and trap pulse transmissions and make delay measurements. All operating parameters are menu selected and retained while power is turned off, the vendor said.

Bit and block error-rate tests can be run on both full- and half-duplex synchronous or asynchronous systems using one of eight patterns. The unit supports RS-232 or CCITT V.24 protocols and will count and display bit errors, block errors, blocks received and synchronization faults, the vendor said.

The CTS 1 costs \$1,495. The firm also announced its high-end version of the CTS 1, the CTS 2, which has been reduced from \$2,295 to \$1,995. Electrodata is located at 23020 Miles Road, Bedford Heights, Ohio 44128.

The things we hear about General Electric service.

"DO YOU FIX EVERYTHING?"



Just about. Micros to minis to modems to multiplexers, General Electric services *thousands* of pieces of computer and communications equipment.

We've got the service facilities to help you all across the country.

We've got carry-in depot service that can save you time and money.

Plus *qualified* service engineers and technicians to do the job *right*.

When your system goes down, you need someone who knows what's up. You need GE.

For the service center nearest you, call 800-528-6050, Ext. 406. (In Arizona, call 800-352-0458, Ext. 406.) Or write: General Electric Company, Instrumentation and Computer Service Department, 705 Corporation Park, Scotia, NY 12305.

GE. Because your system is only as good as its service.

GENERAL  ELECTRIC



HP Customer Service Ranks High: Study

By Marguerite Zientara

CW Staff

FRAMINGHAM, Mass. — Users of Hewlett-Packard Co.'s customer service organization rated HP higher than other users rated their vendors' services in a recent International Data Corp. (IDC) survey of small business systems users.

The 305 survey respondents first ranked the following six factors in descending order of importance: equipment reliability, company reputation, availability of parts, field service organization, cost of service and cost of spare parts. "In every category, [HP users] felt that HP equaled or surpassed their needs," IDC reported in "User Satisfaction With Customer Service," a research report pre-

pared for its Continuous Information Services clients. Those ratings were "higher than any other group of respondents," IDC pointed out.

HP also ranked high in the area of problem correction in a single visit. "Again, [HP] results show they were able to fix the problem in one visit 90% to 99% of the time for 88% of the [HP user] respondents," IDC reported.

"Less than 50% of both Data General [Corp.] and Prime [Computer, Inc.] users had their problems corrected the first time 90% to 99% of the time," the report noted.

In examining desired and actual response times (see Figure 1), IDC stressed that "the desired times will hardly ever

	Desired Time Emergency	Actual Time Emergency	Desired Time Normally	Actual Time Normally
Burroughs Corp.	1.87	3.08	8.50	10.11
Data General Corp.	2.14	4.09	5.36	9.00
Digital Equipment Corp.	1.85	2.95	5.02	5.31
Hewlett-Packard Co.	3.21	3.52	5.48	5.90
Honeywell, Inc.	1.17	7.00	3.17	11.83
IBM	1.50	2.33	3.63	4.25
Prime Computer, Inc.	1.17	2.47	5.22	5.94
Texas Instruments, Inc.	3.31	7.37	9.44	20.81
Wang Laboratories, Inc.	2.32	8.29	8.57	15.93
Third-Party Firms	1.84	4.34	10.86	11.00
Sorbus	1.14	2.09	3.36	10.73

Source: International Data Corp.

Figure 1: Response Time by Vendor (in Hours)

match actual times because users will always expect a little better than they are actually getting." Under normal condi-

tions, IBM led the pack with an average response time of 4.25 hours.

Digital Equipment Corp. followed with 5.31 hours, then HP with 5.90 hours; also in the running was Prime at 5.94 hours. The next closest time was DG with nine hours.

Under emergency conditions, third-party maintenance vendor Sorbus, Inc. starred with an average 2.09 hours response time, followed by IBM with 2.33, Prime with 2.47 and DEC with 2.95.

The longest average waits for emergency service were for Wang Laboratories, Inc. users at 8.29 hours, Texas Instruments, Inc. users at 7.37 hours and Honeywell, Inc. users at seven hours.

The survey pinpointed the three most important elements of telephone service staffing for field service organizations:

- "Giving the user the ability to reach the right person to provide assistance — there

(Continued on Page 46)

	Burroughs	DG	DEC	HP	Honeywell	IBM	Prime	Wang	Sorbus	Third Parties	All
Prompt arrival on site	3.4	3.2	3.6	3.9	3.1	3.6	2.9	3.4	3.5	3.5	3.5
Reaching right person at service office	3.3	3.1	3.7	4.0	3.1	3.7	3.3	3.4	3.8	3.7	3.6
Ability to get parts	3.3	2.9	3.6	3.8	2.9	3.8	2.9	2.9	2.9	3.4	3.5
Reliability of parts	4.1	3.2	3.6	4.4	3.0	4.2	3.9	3.3	3.4	3.8	3.9
Service rep. repairs equip. without tech. assistance	3.8	3.6	3.5	4.1	3.4	3.9	3.6	3.6	3.9	4.1	3.8
No need to replace parts	3.3	3.0	3.1	3.7	3.2	3.5	3.1	3.0	3.4	3.5	3.4
Time taken to return with proper parts	3.3	3.1	3.4	3.6	2.8	3.6	2.8	3.2	2.8	3.4	3.4

Source: International Data Corp.

Figure 2: Service Performance by Vendor Rated on a Scale of 1 to 5, the Latter Representing 'Excellent.'

Rival IBM's 3250 Workstation

CDC Adds Low-End Icem Models

MINNEAPOLIS — Control Data Corp. has come up with two versions of a computer-aided design (CAD) and drafting system centered around the firm's Integrated Computer-Aided Engineering and Manufacturing (Icem) workstation.

The two systems, designed as direct competitors with IBM's 3250 CAD/computer-aided manufacturing (CAD/CAM) workstation, are compatible with CDC's Cyber 170 series of mainframes and its Cybernet time-sharing network.

The entry-level system, dubbed the Icem 120-40, features the Icem 120-40 desktop workstation, CD/2000 design/

drafting software, an IBM Hsp II communications protocol and software that allows the system to operate with plotters made

by California Computer Products, Inc.

The more advanced version (Continued on Page 46)

Compupro Unveils Multiuser Micro

HAYWARD, Calif. — Compupro has unveiled what it is billing as the first multiuser microcomputer that simultaneously executes both 8- and 16-bit industry-standard software.

Dubbed the Multipro Model 10, the four-user system supports word and data processing and communications functions through a shared data base reportedly at speeds faster than

personal computer-based network configurations.

Standard features of the system include an 8 MHz version of Intel Corp.'s 8088 microprocessor with 1M byte of main memory; seven serial ports, including a modem port and a Centronics Data Computer Corp. printer port; 384K bytes of solid-state memory; and dual 5¼-in. floppy disks that hold

1.6M bytes of formatted data. Also, four Zilog, Inc. Z80B processors, each with its own 64K-bit random-access memory chip, are included as part of the standard system.

Compatible with the vendor's MP/M 8/16 operating system, the system also comes bundled with a menu-driven electronic spreadsheet and

(Continued on Page 48)

SYSTEMS & PERIPHERALS

SHIPPING NOW!

SAS* USERS UPDATE!

"USING SAS"(82)

ANOTHER CAI COURSE WRITTEN BY GARY DEWARD BROWN

FROM **CRWTH**

The Information Center People

I have a CAI system installed.
☐ Yes ☐ No

My need is:
☐ Immediate
☐ 1-3 Months ☐ Future

Company _____
 Name/Title _____
 Address _____
 Phone _____

800-282-2372 INSIDE CALIF. (213) 391-6788

CRWTH COMPUTER COURSEWARES
 613 Wilshire Blvd. #200 • Santa Monica, CA 90401



CDC's Icem workstation displays a modeling program.

CDC Extends Icem Series With Low-End Models

(Continued from Page 45)

of the system, called the Icem 120-70, contains the same software as the 120-40, but can support as many as six users simultaneously.

Optional software for both systems includes Basic, Fortran 77, Fortran V programming languages and Data General Corp.'s Comprehensive Electronic Office (CEO) office automation software package.

Al Christman, general manager of manufacturing industry marketing, said the Icem 120-40, priced at \$50,000, is intended to attract small manufacturers that have been unable to afford a high-priced CAD/CAM system. "This new product extends

our Icem solution to small manufacturers who previously could not afford the benefits of CAD/CAM technology," Christman said. Prices for the 120-70 start at \$161,000.

Along with the two Icem/120 workstations, CDC also unwrapped a software program that allows users to create electrical schematics interactively. Price of the program is \$16,500. It is expected to be available during this year's fourth quarter.

The Icem/120 systems debuted last week at the National Computer Graphics Association Show in Chicago, the company said. CDC can be reached through Box O, Minneapolis, Minn. 55440.

Tape Transports Out for Micros

SAN DIEGO — Innovative Data Technology has introduced a line of IBM/Ansi/Ecma-compatible ½-in. magnetic tape subsystems for personal computers.

Three different ½-in. tape transports supporting from 20K bytes to 160K bytes and transferring at tape speeds from 12½ in./sec to 100 in./sec are available, the vendor spokesman said.

All tape transports support 10½-in. reels and may be coupled via the vendor's intelligent controllers to most personal computers, according to the spokesman for the vendor.

Prices for complete subsystems range from \$4,995 to \$9,175. More information is available from Innovative Data at 4060 Morena Blvd., San Diego, Calif. 92117.

HP Service Gets High Marks: IDC

(Continued from Page 45)

must be a knowledgeable person on the other end of the phone."

• "Companies must make it easy to report service problems. This includes a knowledgeable person, perhaps an 800 number, as well as a standard list of appropriate questions to run through to diagnose a problem properly."

• "Another element is the arrival of a [serviceman] within the time estimated by a call-taker. Obviously, once a customer calls in for a [serviceman] and a time commitment is made, the customer begins planning for the arrival of the [serviceman]. That commitment must be fulfilled."

Vendor ratings in those areas were generally satisfactory, according to the survey.

In an attempt to rate the overall performance of the primary suppliers, IDC asked survey respondents to rate the firms in seven specific areas (see Figure 2 on Page 45). "Overall, the responses show that most users are fairly satisfied with all the results, [having indicated] a rating between 3.4 to 3.9," the report said.

Copies of the report are available for \$2,500 from IDC at Five Speen St., Framingham, Mass. 01701.

Everyone in favor of office automation, raise your hand.



Office Humanation goes beyond the centuries-old concept of replacing human labor with machine labor. It sees people as an investment whose growth can compound dramatically over time, given the proper leverage.

CXC's products are designed to provide that leverage in the office of the future. And this could mean a great deal to your future.

We have created for the office a single central nervous system that relates to the way humans really work. The Rose™ Office Humanation System™ is the

first communications system able to support all the functions of the office of the future in one integrated network. Its distributed node architecture, with

MANAGERS

Data Processing Operations Manager • General Accounting Manager • Marketing Administration Manager • Marketing Communications Manager • Product Marketing Managers • Regional Sales Managers • Senior Engineering Project Managers • Software Configuration Control Manager
ENGINEERS
Senior Hardware Support Engineers • Senior Software Support Engineers • Regional Systems Engineers • Senior Systems Engineers • Senior Component Engineer • Senior Digital Design Engineers • Senior RF Engineer • System Test Engineers

If you have at least five years' experience, the appropriate degree (preferably a Master's) and feel you're one of the best, please send your resume and salary requirements in confidence to B. Rosinski, An Equal Opportunity Employer M/F/H/V

DESIGNERS AND DRAFTERS

Mechanical Designers • Senior Electro-Mechanical Engineering Checkers • Senior Mechanical Designers

SENIOR TECHNICIANS

SENIOR CUSTOMER SERVICE REPRESENTATIVES
TECHNICAL WRITERS

PROGRAMMERS

Administration Utilities • Database Management Systems • Data Communications & Networking • Diagnostics • Operating Systems • Telephony Applications • Text Mail • Voice Mail

CDC Seeks Full Integration of CAD/CAM Functions

By Ed Scannell
CW Staff

Realizing the frustrations of most computer-aided design and manufacturing (CAD/CAM) users that are unable to run more complex programs, Control Data Corp., like IBM, is attempting to solve the problem by providing its customers with products that allow them to integrate their engineering, manufacturing and administrative functions.

"CAD/CAM used to be viewed as a graphics problem, but now it is being seen as a data management and telecommunications problem," said CDC's Al Christman, general manager, manufacturing industry marketing. "People want new approaches, integrated approaches, that will tie

all of these islands of automation together," he added.

Christman said today's use of CAD/CAM implementations is characterized by single-function and/or department-level solutions. "As an example, 80% of CAD systems are used for drafting. This dedication to a specific function indicates the use of CAD/CAM as a department-level solution to short-term problems, rather than as part of a corporate, overall long-range plan," he related.

Christman said the consequence of the single-function application is the proliferation of data bases and systems from a number of different vendors that are not accessible to all users. "The result is an expensive, time-wasting, less efficient effort

Analysis

that erodes the productivity the system promotes," he asserted.

This consequence is compounded by the lack of communication among these single-function systems which, according to Christman, also results in a duplication of effort.

Christman said most vendors have been combating these deficiencies over the past couple of years by providing users with:

- More powerful processors that will allow their users to handle more complex designs and analyses as well as support more terminals.
- Improved data base manage-

ment techniques that accommodate the implementation of integration solutions. "The creation of a shared data base is the backbone of this effort," Christman said.

- Increased distributive DP capabilities that will take care of the specific multilevel processing problems of both large and small corporations.

- Three-dimensional solid modeling offerings that will result in the production of more accurate and realistic representation of a solid object.

While most CAD/CAM vendors are working on such products, Christman wonders if the smaller vendors will still have their existing customers to sell to by the time they implement this integrated approach.

Christman explained that CDC's CAD/CAM philosophy is to build on what its customers already have. The key element in the company's integration of CAD/CAM information is its Engineering Design Library (EDL), which permits large amounts of data to be stored in one data base that is accessible by engineers, managers and administrators. "The Engineering Design Library serves as an interface to the user. It manages data and passes it along," Christman said.

Christman contends that one of the major advantages his firm has over IBM is the number of ways it can deliver CAD/CAM products and services. One way is through the company's five applications centers that have opened over the past year.

Another method of delivering services to its customers is through its Cybernet network. Christman said users can process jobs from workstations located on premises. Users of the time-sharing service that dial up or go through dedicated communications links are charged on an hourly or monthly basis. Hourly pricing starts at \$39.50.

According to Daratech, Inc., a marketing research firm located in Cambridge, Mass., CDC's CAD/CAM revenues for 1981 were approximately \$30 million. Christman said the company more than doubled that figure in 1982, and he expects 1983 revenues to be somewhere around \$90 million.

Everyone in favor of Office Humanation, send us your resume.



simultaneous voice and data switching, gives it features far beyond even third generation PBX systems.

Reception by the marketplace has been overwhelming. Prospects are lined up to become beta sites. And several major OEM and distribution agreements make explosive growth a certainty in 1984 and beyond.

The rare career opportunities thus created will be very rewarding. Tomorrow and today. Our compensation package, which includes equity in most

professional positions, is extremely attractive.

You see, Office Humanation delivers the productivity of the computer—with the simplicity of the telephone. And it delivers dramatic savings. In dollar costs. In people costs. Because a job worth keeping is a job worth keeping human.

So think of it this way: If Office Humanation does so much for the people in the office of the future, imagine what it will do for the people in our offices right now.

The Office Humanation Company. CXC

CXC Corporation, 2852 Alton, Irvine, CA 92714 714/860-1801 Office Humanation,™ The Office Humanation Company™ and Rose™ are registered trademarks of CXC Corporation.



NEW LIFE FOR 1401 PROGRAMS

CS-TRAN converts your 1401 object programs to COBOL for the mainframe or mini of your choice.

CS-TRAN is the only translator that accepts your object programs, patches and all, yet allows you to include actual COBOL paragraph names and record definitions.

If you'd like more details about new life for your 1401 programs just call or write Russ Sandberg



C-S Computer Systems Inc.
200 South Main Street, P.O. Box 356
Manville, NJ 08835 • 201-526-9000

With NAPLPS Protocol

IBM Adds Graphics to Series/1 Videotex System

RYE BROOK, N.Y. — IBM has enhanced its Series/1 Videotex System with the North American Presentation Level Protocol Syntax (NAPLPS) protocol, allowing it to display color graphics. The company also added teleconferencing capabilities to the system, as well as compatible programming aids.

The color graphics capa-

bilities are intended to extend the ease-of-use advantages of videotex into new business areas such as advertising and business forecasting and planning groups, according to the company.

The graphics capabilities allow users to select the graphics technique best suited for their individual applications. For example, graph-

ics requiring high-resolution, precise line drawings can be designed using an "alphanumeric" technique that melds lines, points and curves to form picture-like patterns, a spokesman explained.

Less complex color graphics designs can be created using "alphamosaics," a technique employing tiny

rectangles gathered in a building-block fashion, forming mosaic patterns, the spokesman explained. Prestel-based alphamosaic images can be generated with an on-line editor program at designated videotex terminals, including the company's Personal Computer.

The programming aids make it easier for users to

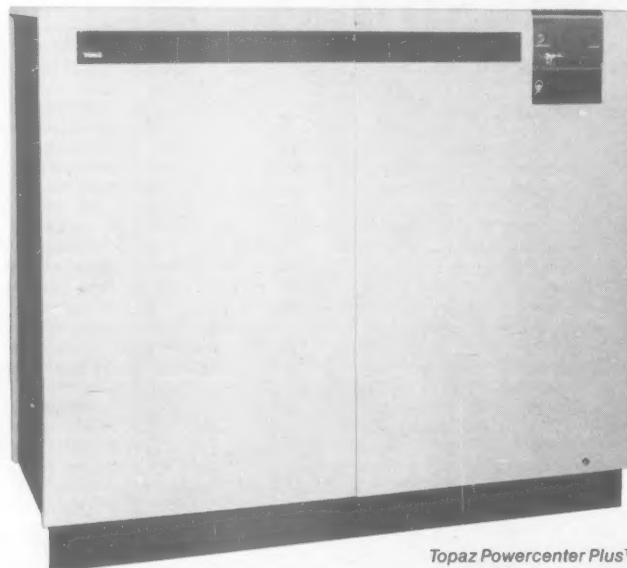
write applications programs that access both local and remote nonvideotex data bases. With such programs, users can transmit inventory and stock status reports from a host computer like an IBM 3081 to videotex terminals scattered throughout sales and service offices.

The teleconferencing feature enables Series/1 users in one location to present information on new products or business procedures simultaneously on multiple videotex screens in other locations. While the visual information is being transmitted, voice communications can be conducted over normal telephone conference-call hookups.

A "billboard" capability permits continuous viewing of a sequence of information. Frames of information in a billboard advance automatically.

The Series/1 Videotex System Version 1.1 program carries a one-time charge of \$12,500 and will be available in the second quarter of 1984, IBM said from 900 King St., Rye Brook, N.Y. 10573

You Probably Thought We Were Selling Computer-Controlled Computer Power.



Topaz Powercenter Plus™

Actually...We're Selling Peace of Mind.

Some jobs are difficult. Others are just plain impossible — like estimating all the costs of computer errors due to line voltage sags and surges, to say nothing of brownouts. But now for a small percentage of your facility investment, you can have complete protection against troublesome voltage variations. And you can have immunity from noise and the effects of load

changes, frequency changes and power-factor changes too. Not to mention flexible distribution of power throughout the computer room, monitoring of all key power parameters, and two-level facility protection. Powercenter Plus — it's the only power distribution center that does it all. Complete with microcomputer-controlled power conditioning, of course.

**That's peace of mind.
That's our business.**

TOPAZ

9192 Topaz Way, San Diego, California 92123-1165 — (619) 279-0831 — TWX: (919) 335-1526

Compupro Announces Multipro

(Continued from Page 45)
word processor and a data base management system.

According to Compupro President William Godbout, the Model MP 10 will be aimed at organizations that have been using personal computers to run applications and have created data bases they want to run on more powerful systems.

"We see Multipro as the forerunner of several computer configurations that can be expanded into entire networks of multiuser systems," Godbout explained. He added that by using both 8- and 16-bit microprocessors, his firm can offer a "higher price/performance ratio and make multiuser multiprocessing capability available to a wider audience."

Hardware options for the system include a math coprocessor priced at \$495; the company's 4M-byte M-Drive/H disk emulator, which costs \$15,950; and mass storage options, including an external 2.8M-byte floppy drive subsystem for \$2,395.

Priced at \$4,995, the Model MP 10 will be available in volume by October of this year. Compupro is located at 3506 Breakwater Court, Hayward, Calif. 94545.

For Its Series 50, OAS

Prime Unveils Micro-Based Workstation

NATICK, Mass. — In an attempt to keep its Office Automation System (OAS) an integrated system, Prime Computer, Inc. has announced its first microcomputer-based workstation designed specifically to work with its Series 50 minicomputer and OAS.

The desktop Producer 100 is based on the Convergent Technologies, Inc. Application Workstation (AWS), under a recently announced agreement with that company. The workstation uses Convergent Technologies' Ctos operating system on top of the Prime Primos operating system, a Prime spokesman said.

The workstation offers 384K bytes of main memory and an Intel Corp. 8086 microprocessor. Other features include a detached keyboard and a 15-in. CRT and local-mass storage, a Prime spokesman said.

The workstation uses a 5¼-in. disk drive for mass storage with a capacity of 630K bytes, a Prime spokesman said. Other storage options include a 5¼-in. mini-Winchester hard disk with capacities of 5M bytes, 10M bytes or 16M bytes.

Permits Migration

Software for the workstation is said to permit migration to the workstation for current Prime OAS users under the Prime 50 Primos operating system. Producer 100 word processing software offers most standard functions including split screen, list processing, global search and replace and print wheel pitch control, according to the spokesman.

Other software available for the micro is Multisoft, Inc.'s electronic spreadsheet Multiplan, designed for business



Prime Producer 100

planning, budgeting, forecasting and "what if" analysis.

The workstation is available immediately. Prices are \$7,900,

\$9,900 and \$10,900 for the 5-, 10- and 16M-byte versions from Prime, located at Prime Park, Natick, Mass. 01760.

Sperrylink Desk Station Enhanced

BLUE BELL, Pa. — Sperry Corp. has introduced an enhanced version of its Sperrylink office system Desk Station. The new version includes a low-profile diskette subsystem with a detached keyboard and a character printer, according to the vendor.

Also introduced was software to allow file transfer with word processors from other vendors.

The basic configuration of Sperrylink now includes the Desk Station, a diskette subsystem, a printer and an optional document reader, according to the vendor.

This system is supported by the Distributed Office Processing Station and a Sperry 1100 Series computer system, a Sperry spokesman said.

The Sperrylink Desk Station Model 30 reportedly features local processing and memory, along with the 8439 Diskette Subsystem and the 0431 printer.

The Diskette systems support a 5¼-in. single drive subsystem of 655K bytes of storage. This is



Sperrylink Office System

expandable to a second drive to store a total of 1.3M bytes, a Sperry spokesman said.

The 0431 Character Printer is a daisywheel printer reportedly capable of correspondence-quality printing at 55 char/sec.

Also introduced was a Document Reader for Sperrylink.

The reader uses optical character recognition technology to eliminate the need for manual keyboard entry.

The same reader also allows typewritten pages to be read directly into a Desk Station, a Sperry spokesman said.

Offering compatibility with word processors from IBM and Wang Laboratories, Inc., Sperry also introduced the Sperrylink Document Converter.

The package provides document compatibility with the Wang Office Information Sys-

(Continued on Page 50)

ATV Offers Companion To J500 Mini

SANTA ANA, Calif. — ATV Systems, Inc. has announced a multiworkstation J600 system in a floppy-only configuration with a 40 char./sec letter-quality printer.

Designed as a companion to the J500 minicomputer system, the workstation can also be equipped with a 12M-byte or 24M-byte cartridge disk for distributed data processing.

The J600 reportedly includes a CRT and keyboard, two dual-density flexible disk drives, two asynchronous/IBM protocol Binary Synchronous Communications ports, an autodial port and a parallel printer interface.

Customers who currently have J500 systems can upgrade to a J600 for \$8,037 or \$10,574, depending upon the number of workstations desired.

More information is available from ATV Systems at 2921 S. Daimler, Santa Ana, Calif. 92705.

OFFICE AUTOMATION

DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS

SATURN-CALC

ELECTRONIC FORECASTING AND FINANCIAL MODELING

Available for immediate delivery

- Provides multiple worksheets in a file
- Outputs ASCII files compatible with WP SATURN and other applications
- Written in assembly language
- Supports most common CRT's — VT100, VT 52, ADDs, Hazeltine...
- Provides help text and prompts
- Supports variable width columns

FOR MORE INFORMATION
CALL
800-328-6145

SATURN
SATURN SYSTEMS, INC.
6875 WASHINGTON AVENUE SOUTH, SUITE 218
MINNEAPOLIS, MN 55435 • 612/944-2452

DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS DEC USERS

Weighing In at 18 Lb Portable Systel I Debuts

SAN JOSE, Calif. — Systel Computers, Inc. has introduced a full-featured portable word and number processor with a detached keyboard and printer interface module.

The Systel I is said to be portable and features a 10-in. CRT with a 5¼-in. disk drive. The unit weighs 18 lb and includes a carrying handle.

Documents reportedly can be transmitted anywhere using an optional communication link that connects to other computers, word processors, terminals or external modems.

The Systel I's printer interface module enables the unit to connect with printers, a vendor spokesman said.

The unit is priced at under \$2,000, according to the vendor. More information is available from Systel Computers, located at 399 W. Trimble Road, San Jose, Calif. 95131.

Daisywheel Offers Compatibility

BELLEVUE, Wash. — Transtar has introduced a daisywheel printer that features compatibility with major word processing software.

The Model 120 uses existing routines for boldface, underscore, superscript and subscript printing, letter quality printing at 14 char./sec and switch-selectable spacing at 10, 12 and 15 char./in.

The Model 120 includes an auto-

SAN FRANCISCO — CPT Corp. has announced a spelling package that reportedly verifies words as they are typed and checks documents after they are recorded.

The CPT Spelling Verifier uses a

matic paper-loading system that allows cut sheet paper to be loaded to one of four positions. Switch-selectable printing positions were designed for common printing applications, such as correspondence on business stationery, the vendor said.

The printer is priced at \$599. More information is available from Transtar through Box C-96975, Bellevue, Wash. 98009.

72,000-word electronic dictionary that is said to provide better than 99% accuracy on all general applications.

The spelling verifier also provides for additional customized word lists of up to 1,500 words each. The customized lists can be typed and recorded, or added directly from text as it is being verified.

The system also reportedly recognizes and checks for capitalization and hyphenation. Additional features include instant reverification of words after they are corrected and the ability to store and use consecutively any number of customized word lists.

The spelling verifier runs concurrently with existing CPT word processing features and is available on CPT 8100 and 8500 Series computer systems.

The spelling verifier costs \$500. More information is available from CPT Corp. at 8100 Mitchell Road, Box 295, Minneapolis, Minn. 55440.

CRT Shield Protects Eyes

NEW YORK — Langley-St. Clair Instrumentation Systems has unveiled an anti-eye-fatigue screen for CRT terminals. The anti-eye-fatigue screen shield reportedly is made of the same lead-impregnated acrylic plastic used for windows in nuclear plants and hospital X-ray rooms.

The Eye Guard is a 7mm-thick sheet of transparent plastic that contains 30% lead by weight to offer antiradiation properties and affixes to the front of a computer terminal with Velcro tabs. The front surface is covered with a nylon-netting anti-glare screen, the vendor said.

The Eye Guard is priced at \$129.95 and is guaranteed to stop "the worst case of eye fatigue," according to Langley-St. Clair, located at 132 W. 24th St., New York, N.Y. 10011.

Sperrylink Desk Station Enhanced

(Continued from Page 49)

tem, VS and other Wang word processing equipment.

Compatibility with the IBM Displaywriter and Office System 6 is also provided, according to the Sperry spokesman.

The basic price of a Sperrylink Desk Station is \$3,530. A typical clustered system serving a department of 15 end users would average \$8,552 per workstation, including such units as a Distributed Processor, Desk Station, diskette, printers and appropriate software, the vendor said.

A 32-person department with the same type of clustered configuration reportedly would cost an average of \$7,893 per workstation.

The Document Reader is available for \$9,500 for each type of word processor connection.

More information is available from Sperry, through P.O. Box 500, Blue Bell, Pa. 19424.



Why settle for half the VAX data management solution?

Finally, VAX® users have a complete data management software package. It's called SMARTFORM, and it integrates all principal data management elements: forms management, file management, and interactive query.

Other current VAX forms management packages offer bits and pieces, and require writing programs to create and open RMS files, plus program code to access data. But not with SMARTFORM... the first (and only) fourth-generation VAX/VMS® data management tool. It provides you the ability to create complete applications: defining forms, creating files

and performing database queries... without having to write a single line of program code!

Even VAX users who've spent the \$15,000 for Datatrieve™ don't have this level of data management capability (although SMARTFORM and Datatrieve work nicely together with the automatic interface we provide). If you already have a forms management package, you'll still be glad you bought SMARTFORM. The additional benefits are substantial, and the price is attractive. Options are also available for interfacing SMARTFORM with any VAX host-program, and for providing general report writing.

Only SMARTFORM provides you the complete VAX data management solution... the ability to "paint and process" with zero lines of code. We don't even require "non-procedural" (read "programmer-friendly") code.

Write or call today, and start getting complete data management from your VAX.



Signal Technology, Inc.

5951 Encina Rd.
Goleta, CA 93117
Call toll-free (800) 235-5787
California (805) 683-3771

VAX, VAX/VMS and Datatrieve are trademarks of Digital Equipment Corporation.

New Rules Ease High-Tech Trade With China

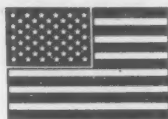
By Bill Laberis
CW Staff

WASHINGTON, D.C. — It was a combination of politics and business sense that prompted the Reagan administration late last month to liberalize the ground rules for the export of U.S.-made high-technology equipment to China.

While U.S. computer equipment vendors are still taking stock of the rules change, it is clear that the administration move will meet with overwhelming approval within the industry.

Said a spokesman for one U.S. company, "We're a little cautious about saying anything at this point. But I can honestly say we're excited as hell. There's a huge potential market in China. Just think of the numbers of people and where they're at with computer technology."

Indeed, China lags years if not decades behind industrialized Western countries in terms of computer resources. Last year, for the first time, the Chinese government used DP to take its census. Of the 30 IBM computers used to count the one-billion-plus heads in China, 21



Analysis

CPUs were donated by the United Nations.

But the recent easing of export regulations, coupled with China's aggressive modernization drive, may radically change the state of DP throughout the country. And many U.S. vendors, especially IBM and plug-compatible manufacturers (PCMs), stand to profit as a result.

The change in Commerce Department

rules allows for the export to China of so-called dual-purpose high-technology equipment. Much of the exports falling into this category are either computer equipment of machinery or manufactured computers and their components.

China, henceforth, will be placed in an export category that bars the sale of military equipment, but allows vendors to assume they can export their wares unless told to do otherwise. Formerly, computer equipment vendors assumed they could not export any items to China unless informed to the contrary, a mirror image of the new rules.

Published reports predicted the new rules will increase U.S. exports to China by up to \$2 billion, with most of this increase coming from sales of computers, semiconductors and telecommunications equipment.

The Commerce Department, which has battled the Defense Department for more liberal export rules, has claimed that China's greatest DP needs are in the education, not military, area. Honeywell,

(Continued on Page 54)



John Imlay

CW Photo by P. Gillis

Computeristics Gets \$6 Million

MSA to Buy Software Division

ATLANTA — Management Science America, Inc. (MSA) has signed an agreement to acquire the software division of Computeristics, Inc., a Hamden, Conn.-based firm specializing in accounts receivable and order processing software for IBM mainframes.

The \$6 million deal will add Computeristics' Customorder order processing system to MSA's line of manufacturing software and merge features of the Computeristics' accounts receivable package with MSA's accounts receivable product, according to John Imlay, chairman of the board of MSA.

The agreement continues MSA's penetration of new markets through acquisition. Early last year, the company entered the manufacturing software field by ac-

'MSA has been actively looking to strengthen its customer base in the field of material requirements planning (MRP) ... [a gap] the Computeristics acquisition will help to fill.'

quiring Arista Manufacturing Systems, the manufacturing software division of Xerox Corp.

MSA has been actively looking to strengthen its customer base in the field of material requirements planning (MRP), a planning system which is the backbone of manufacturing systems. An integrated order processing and accounts receivable system is "a vital part of MRP," which the Computeristics acquisition will help to fill, Imlay said. MSA currently has about 100 MRP customers.

Computeristics' planned sales for 1983 were about \$4 million, Imlay said. "[Computeristics'] products will be put out to our market force, and sales [of those packages] should exceed \$10 million over the next 12 to 18 months," he predicted.

MSA had been working on an order entry package of its own, "but we looked at

(Continued on Page 52)

National Semi Reverses Trend, Reports \$7.7 Million Profit

SANTA CLARA, Calif. — Bolstered by a strong performance in its semiconductor division, National Semiconductor Corp. has reported a \$7.7 million fourth-quarter profit on sales of \$321 million, reversing a trend of quarterly losses.

For the year, National Semi posted a \$14 million loss on sales of \$1.2 billion, compared with a net loss of \$11 million on sales of \$1.1 billion in fiscal 1982. The company's fourth-quarter earnings reflected a nearly \$3 million after-tax gain resulting from the settlement of an insurance claim that began five years ago. The quarter's results also reflected the performance of recently acquired Data Terminal Systems, Inc. (DTS), which posted a "modest loss" on sales of nearly \$19 million, the company said.

Commenting on the results, Charles Sporck, president and chief executive officer, said DTS' Datachecker and National Advanced Systems, Inc., National Semi's wholly owned systems subsidiary, both attained record sales levels. The semiconductor division, he said, "ended the fiscal

year with strong order rates resulting in lengthening of lead times and a strengthening of prices for some products," despite continued price erosion for many semiconductor offerings.

Intel Forges Bus Consortium

HILLSBORO, Ore. — In a move designed to speed the process of industry standardization, Intel Corp. has forged a 13-company consortium to develop the specifications for a new microprocessor data bus.

The bus — which acts as an informational pathway between the central processor and the computer's peripherals — will be called Multibus II, based on an architecture to meet the needs of advanced 8-, 16- and 32-bit microprocessor-based systems, a spokesman said.

Intel said it expects to publish Multibus II specifications later this year, while providing review materials to the recently formed Multibus Manufacturers Group,

an independent organization of vendors supplying Multibus-compatible products and services.

The company's earlier Multibus architecture, IEEE 796, has been adopted by more than 150 electronics companies supplying more than 1,000 separate Multibus-compatible products, Intel claimed.

U.S. and foreign companies joining Intel as members of the consortium include: Advanced Micro Devices, Inc.; Nixdorf Computer Corp.; Intersil Systems, Inc.; Zilog, Inc.; Hewlett-Packard Co.; Tektronix, Inc.; International Computers Ltd.; Siemens AG; Mupac Corp.; Matra Co.; Compagnie des Machines Bull and Dataindustrial AB.

OPEN WORLD

Means Open Opportunities

BNR Is Creating The Ultimate In Advanced Telecommunications.

BNR, a leader in communications research, is developing one of the most technically innovative telecommunications projects of the decade. OPEN World—Open Protocol Enhanced Network—is the framework of advanced communications. Developed by BNR and marketed by Northern Telecom, OPEN World will enable businesses to design integrated information systems uniquely suited to their voice and data communications needs.

Do Not Wait To See OPEN World In Action!

Why wait to see OPEN World implemented, then wish you had the chance to work on its development. OPEN World means opportunities for telecommunications professionals with the talent and dedication to advance this significant project.

Your challenge is to combine technology and creativity, with a vision of the future—this is the essence of OPEN World and these are the opportunities available to you as a member of the BNR development team:

Data Communications

Your role in the design of data communications equipment will help advance the data services capabilities of our systems. Requirements include a BS/MS in CS or EE (or equivalent), and 5 years' hands-on experience designing modems, data switches, multiplexers, X.25 interfaces (X.3, X.28, X.29) and LAN interfaces. Knowledge of protocols including HDLC, BISYNC, etc. is essential, and an IBM SNA background is desired.

Digital Logic Design

Work with state-of-the-art microprocessor technology, introducing digital circuit designs and taking them through development and production phases. Three years of digital logic circuit design experience are required. Knowledge of digital signal processing, microprogramming or data communications protocols is desirable.

Office Automation Software

You will define and implement a wide range of software focusing on the integration of voice, text and image displays in single terminals and workstations. This position requires related technical experience (voice, text and graphics applications), plus the ability to utilize creative design to guarantee attractive user interface. Desirable experience includes structured design and high level languages, preferably PASCAL.

Systems Programmer UNIX

Utilizing a variety of hardware and software, you'll have the opportunity to explore UNIX on different computer systems. You will also maintain UNIX on our DEC system. You should have a BSCS or equivalent, plus at least 2 years' experience.

VM Applications Programmer

Advance the leading edge of telecommunications, writing new general purpose utilities and applications in our VM/SP support environment. Requirements include knowledge of EXEC2, IBM 370 assembler language, PASCAL, or PL1 plus 2 years' experience and a BSCS or equivalent.

Programmer Analyst—RSX-11M

Use your knowledge to perform real-time application projects. Working in a multi-task environment, you will utilize real-time application programs to communicate with a PABX through an RS-232 interface. Your extensive internal software knowledge of RSX-11M, as well as experience with PDP-11/23 and PDP-11/44 would be very desirable. Additionally, hands-on experience with microcomputers and a thorough knowledge of PASCAL is useful. A BSCS or BSEE (or equivalent) and 2 years' RSX-11M experience is required.

A Leader That Listens.

When you join BNR, you're joining a world leader in communications research that listens to its people—one reason we've been successful over the last 25 years. Backed by the resources of Northern Telecom, we provide unparalleled opportunities for professional growth and advancement within today's most rapidly growing industry.

For immediate consideration call our toll free number.

(800) 538-8157 ext 963 (outside Calif.).

(800) 672-3470 ext 963 (within Calif.).

Or send your résumé to: Susan Voshell-Bax, Sr. Technical Recruiter, BNR, INC., MS-412-A, 685A East Middlefield Road, Mountain View, CA 94043. U.S. citizenship or permanent residence required. We're an equal opportunity employer.

We're Listening.

BNR

Cary Retires; Ends 35 Years As IBM Exec

ARMONK, N.Y. — Frank T. Cary, who led IBM through lean years in the late 1970s to the relative prosperity it enjoys today, officially retired as an IBMer last week. He will continue as chairman of the executive committee of the company's board of directors.

Cary began with IBM as a marketing representative in Los Angeles 35 years ago and was subsequently named president and general manager of the Data Processing Group. He was elected to the board of directors in 1968 and became president in 1971 and chairman in 1973.

Commenting on Cary's departure, John Opel, chairman and chief executive officer, said, "As a business leader and strategist, Frank Cary had no peer. He guided us to the substantial success we have enjoyed, and he laid the foundation for our success in the future."

MSA Agrees To Acquire Division

(Continued from Page 51) Computeristics' and were smitten by their research and development and technology," Imlay said.

Current Computeristics customers will be supported by MSA. MSA will market both companies' accounts receivable packages for the next 30 days and then integrate them into a single product, with upgrades available to users sometime this year, according to MSA's chairman.

MSA will absorb the 62 Computeristics employees and will continue to support Computeristics' customers. Computeristics' President James H. Chambers will become director of MSA's customer service division, Imlay said.

Office-Mate/ List Processing

Software for IBM Mainframes

- On-Line CICS Support
- DOS: \$10,000.00
- OS: \$13,500.00

To try it yourself, call:

312-843-1188

NSL

NATIONAL SYSTEMS LABORATORIES, INC.
999 Plaza Drive • Schaumburg, IL 60195

Attention:

Data base administrators
IMS-DL/I programmers
SAS users

SAS/IMS-DL/I saves you time

Product Sales Summary
Data for 1983

Product Code A100 - WIDGETS

			Region of U.S.				
			North Central	Northeast	South	West	
City Size		Quantity	Total	17057	15045	13277	12603
			Total	26757.94	24040.36	18853.55	16777.59
	\$ Amount	Percent of Regional Sales	55.8	42.9	47.4	50.8	
			Total	9012	13509	13280	11605
50000 to 500000	Quantity	Total	13787.06	22071.22	20994.00	14210.25	
		Total	28.7	39.4	52.6	43.0	
	\$ Amount	Percent of Regional Sales	28.7	39.4	52.6	43.0	
			Total	7428.34	9944.05	None	2034.05
Under 50000	Quantity	Total	4048	5131	None	1811	
		Total	15.5	17.7	None	6.2	
	\$ Amount	Percent of Regional Sales	15.5	17.7	None	6.2	
			Total	7428.34	9944.05	None	2034.05

Replace your lengthy COBOL, PL/I or assembler programs with SAS/IMS-DL/I™ a high-level programming language for accessing and maintaining DL/I data bases.

Data base administrators: With SAS/IMS-DL/I you can test many structures as you design or modify data bases. Use SAS/IMS-DL/I to build test data bases, convert data bases from one structure to another, rearrange fields within segments, verify DL/I call sequences in program specifications and correct data in existing data bases.

IMS-DL/I programmers: Implement batch IMS-DL/I applications—data base maintenance programs or data report programs—with SAS/IMS-DL/I. Use IMS-DL/I logging to insure data base integrity and recoverability.

SAS users: Write SAS/IMS-DL/I programs to extract data directly from DL/I data bases without an IMS programmer.

SAS/IMS-DL/I—the kind of powerful time-saver you've come to expect from SAS Institute.

SAS Institute Inc., SAS Circle, Box 8000, Cary, NC 27511 USA. Phone (919) 467-8000. Telex 802505.

SAS Institute GmbH, Rohrbacher Strasse 22, D-6900 Heidelberg 1, West Germany. Phone 06221-29014. Telex 461581.

SAS Software Ltd., The Centre, 68 High Street, Weybridge, Surrey KT13 8BL, UK. Phone 0932-55855. Telex 946138.

SAS Institute (NZ) Limited, PO Box 10-109, The Terrace, Wellington, New Zealand. Phone (4) 727-595. Telex NZ 31525.

SAS Software Pty. Ltd., Level 60, MLC Centre, 19-29 Martin Place, GPO Box 4345, Sydney, NSW 2001, Australia. Phone (02) 235-2199. Telex AA 71499.



Birth Pangs of U.S.-China Tech Trade Diagnosed

By Bill Laberis
CW Staff

While the market potential for U.S. computer vendors is indeed great in China, so too are the potential problems that carry the warning "seller beware."

Perhaps the greatest problem U.S. vendors will face in China, now that

Export Rules To Ease Trade With Chinese

(Continued from Page 51)

Inc. has been awaiting an export license to ship its computers worth more than \$15 million earmarked for educational programs in China.

But other observers claim the self-sufficient Chinese are more interested in building their own technological infrastructure and will hotly pursue the acquisition of semiconductor and chip manufacturing equipment. This is precisely the type of goods which U.S. agents have seized in raids in recent years from smugglers employed by Eastern Bloc nations and the USSR. Thus, there is speculation that the Defense Department will attempt to stonewall the new export rules by broadly defining what it considers militarily sensitive exports.

The Defense Department's blocking efforts notwithstanding, the Chinese appear determined to develop their own computer manufacturing capability, with or without American exports. According to one ranking Chinese official, China's efforts should be directed toward developing PCM-like technology.

In an article that appeared earlier this year in *China Computerworld*, Chen Renfu, deputy director of Huadong Institute of Computing Technology in Shanghai, said, "China should pay more attention to developing PCM technology... IBM's and [the] PC's computers... have the most complete software for a wide range of applications."

STC, Dupont Join Forces

LOUISVILLE, Colo. — Storage Technology Corp. (STC) has entered into a joint development agreement with Du Pont Co. for the refinement of STC's optical laser recording media and its process for large-scale production of that media, the company announced recently.

STC, which has been stung by successive quarters of earnings slippage, has touted optical technology as one of the product lines it hopes will sustain future growth. Optical laser recording media is the component of a high-density optical storage subsystem which records data.

STC's optical laser data storage subsystem is slated for initial shipment later this year. The joint development venture will enable the company to utilize Du Pont's expertise in materials and process manufacturing to ease STC's transition to full-scale production of the media, STC said.

trade restrictions have been eased (see story on Page 51), is associated with their newness to that vast market.

European and Japanese counterparts, meanwhile, already have a toe-hold in the Chinese market and thus are more familiar with the nuances of doing business there. According to the *EDP China Report*, one of the few English language newsletters of the Chinese DP industry, "It is a fact that the U.S. electronics industry has failed to complete a lot of sales when trading with China because of the stupid policy followed by the U.S. government."

While those policies have apparently changed now, other problems will linger. U.S. vendors must identi-

fy the end users in China's fledgling computer sector, determine their needs and then seek out the party or parties who make the purchase decisions.

Further, China's planners, while aware of their country's pressing needs to computerize, want to develop a technological infrastructure in a nation where the basic means of production across the board are backward, the *China Report* has stated. Thus, those U.S. vendors selling semiconductor manufacturing and systems testing equipment will have to be particularly patient with a nation that still performs many complex industrial procedures by hand.

On the other hand, the stated willingness of the Chinese to modernize

and sustain its billion-plus people bodes well for U.S. computer vendors, given the country's unique problems. Last March, China's first computer users group, the Chinese Computer Users Association, was inaugurated.

The association is a nationwide organization consisting of users, manufacturers, research institutes and service centers. Its aim is to "protect the rights and interests of users, strengthen the ties among users and between the users on the one hand, and the research institutes and manufacturers on the other, promote co-operation and experienced exchanges and raise the efficiency of computer applications," the *China Report* noted.

The ergonomics of our new

We were there at the birth of modern word processing. So it should come as no surprise that when we designed the Raytheon information processor, we didn't forget that human beings come with backs, arms, fingers, necks, eyes and other assorted parts. And use them in different ways to do different jobs in the office.

Instead of demanding that people adapt to our system, we designed our RDS-200 Series of information processors to adapt to people. That's ergonomics, Raytheon-style. Result: an information processor that's one of the most comfortable and easiest to use.

And it's also versatile. It can converse with a variety of other word processors, host computers and mini and personal computers. And with widely available CP/M® software, it can perform all kinds of office data processing jobs.

Planning for shared resources, clustered word processing and, finally, a fully integrated office system? Look to Raytheon, the experienced source. Call 800-343-6676; in Massachusetts: 617-762-6700, ext. 3137. Or use the coupon.



Charges Copyright Infringement

Micropro Files Suit Against United Computer

SAN FRANCISCO — Micropro International Corp. is suing United Computer Corp. of Culver City, Calif., claiming the software leasing firm is renting Micropro software packages and allowing users to copy them.

The suit, filed last month in U.S. District Court here, charged that United Computer has infringed on Micropro's copyright and distribution rights and has contributed to the unauthorized reproduction of Micropro's line of microcomputer software, including the firm's Wordstar word processing package.

The suit further charged United Computer with engaging in unfair

competition with Micropro, according to attorney Ron Laurie. Laurie is with the San Francisco law firm of Townsend and Townsend, which is representing Micropro.

Named as defendants in the suit were United Computer President S. Gerald Stone and three other company principals: H. George Pollack, Robert Pollack and Norma Pollack. Repeated attempts by *Computerworld* to reach the defendants were unsuccessful.

Micropro is asking for punitive damages of \$10 million from United Computer and \$1 million from each of the defendants. In addition, Micropro is asking for \$50,000 for each

copyright infringement. However, the suit did not state how many infringements there have been.

The suit charges United Computer with buying Micropro software products, removing a printed license agreement Micropro supplies with each diskette it sells, repackaging the diskette and renting the software to the public.

Furthermore, according to the suit, the license agreement, which Micropro claims United Computer has removed, states that the user of the package cannot copy the package except for archival purposes and that the software is the property of Micropro. The license agreement further

states that use of the package is limited to one processor, the suit said.

"The defendants have devised, set up and conducted their software rental business in the belief and with the knowledge that the great majority of their customers will unlawfully copy the rented software and return it to the defendants prior to, or at the end of, the one-week rental period," the suit charged.

The case will be heard by Judge William Schwarzer, who presided at a similar Micropro case last fall in which Micropro and Digital Research, Inc. were jointly awarded \$250,000 in a suit charging Dataforce International and its subsidiary, Data Equipment, Inc., with illegally copying the firms' software programs.

VP Leaves Tandy To Become Head Of Microsoft

BELLEVUE, Wash. — The man who spent 25 years helping build Tandy Corp. into the largest retailer of microcomputers has left that company to become president of Microsoft, Inc., developer of the Xenix and MS-DOS operating systems.

Jon Shirley, 45, will fill the slot vacated last month by James C. Towne, who left after a year at Microsoft subsequent to a falling-out with William Gates, the company's chief executive officer.

Commenting on his appointment, Shirley, who stepped down as Tandy's vice-president of computer merchandising, said, "The decision to make this career change was a difficult one, but I consider this a once in a lifetime opportunity."

DG Earnings Up 23% for Quarter

WESTBORO, Mass. — Data General Corp. posted profits of \$4.3 million or 36 cents per share for its most recent quarter, a 23% earnings gain over the same quarter a year ago.

Revenues in the quarter were flat, however, totaling \$189 million. The company reported that orders "are being delayed at senior administrative levels due to hesitations about the pace of the general economic recovery and tight controls on operating capital budgets."

The firm has shipped "a significant number" of its MV/10000 high-end superminicomputers, according to Edson de Castro, DG's president and chief executive officer.

information processor.

The characters on our screen are bigger than most. And our nonglare green-on-black screen is easy on the eyes.

We sculpted our keys to conform to the contours of the fingers. A small point perhaps, but it makes a big difference after hours at the keyboard.

Our display swivels and tilts so your neck doesn't have to. A little extra comfort can mean a lot of extra productivity.

Most computer companies ask you to memorize multiple keystroke command codes. Raytheon gives you one-stroke command keys—each labeled in plain English.

A command key calls up a special full-page mode that lets you see exactly how your work will look on the finished page.

A tilting leaf lets you angle the keyboard instead of straining your wrists.

Our hydraulic chair adjusts with the flick of a lever to support your back and reduce strain and fatigue.

Mail this coupon today

Raytheon Data Systems
Box 7, Marketing Communications
1415 Boston-Providence Turnpike
Norwood, Massachusetts 02062

- ☐ Please send me all the facts on the new Raytheon RDS-200 Series of information processors.
☐ Please have a sales representative call me.

NAME _____ TITLE _____
FIRM _____ TEL. _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____

RAYTHEON

We design computers around people.



Litigator Defines Monopolistic 'Tie-In' Violation



CW Photo by P. Keefe
Richard A. Horning

By Patricia Keefe
CW Staff

BOSTON — In computer industry antitrust litigation, to what length must the prosecution go to prove monopolistic behavior involving so-called "tie-in" violations on the part of a vendor?

According to Richard A. Horning, an antitrust litigator, the prosecution must first prove the existence of two products where the purchase of one product is conditioned upon the purchase of the second product. It must further be shown that the vendor has sufficient economic ability in the "tying" market to restrain competition in the "tied" market.

Horning, a partner in the law firm of Ream, Train, Horning, Ellison &

Roskoph of San Francisco, made his remarks at a recent meeting of the Boston Computer Law Association.

While economists hold that the only time a company can impose a tie-in in one market is when it has a monopoly in another, "the courts have yet to come to grips with that issue," Horning said.

What the courts have decided, however, is that the presumption that copyright and patent ownership gives rise to a mythical power to impose a tie-in is rebuttable, as evidenced in the recent antitrust litigation involving Data General Corp., he said. The court found that "other companies are free, notwithstanding the copyright, to develop their own comparable product," Horning said.

Patents are a little trickier, he added, because they literally prevent others from repeating the initial effort.

"The question here is how one uses those rights — whether those rights are used to improperly extend powers conferred by those rights into another market," he explained.

Horning cited the 1936 IBM Tabulator case as an example. Although IBM held a legitimate patent on its machine, it used its "legitimate monopoly" to force customers to purchase an undesired product in a separate market — high-priced punched cards.

Other elements related to tie-in violations, he said, as summarized from recent Data General Corp. antitrust litigation, include:

- A substantial amount of commerce in the tied product market must be affected.
- Plaintiffs must prove some actual injury that is causally linked to the antitrust violation.
- Some courts have required that the seller of the tying product have an economic interest in the tied product.

McGill Named To Trilogy Board

NEW YORK — Archie J. McGill, former president of American Bell, Inc.'s Advanced Information Systems (AIS), has been named a member of Trilogy Ltd.'s board of directors, according to a recent announcement by Gene Amdahl, Trilogy's president.

McGill resigned from AIS last month [CW, June 13].

In announcing McGill's appointment to the Trilogy board, Amdahl said, "Archie McGill brings to Trilogy significant expertise in all aspects of the information processing industry and will make an important contribution in assisting Trilogy in developing its strategic direction."

McGill is also president and chief executive officer of Rothschild Ventures, Inc. and managing director of the firm's parent company, L.H. Rothschild, Inc.



With MPC's 200/300 series, he gave us word processing, 3270 communications, spreadsheet and multiple programming language capabilities.

From single intelligent workstations to large system clusters, MPC's 200/300 system series lets you expand at your own pace—without changes to operating software. You share multiple systems resources at a low cost-per-user station.

Series 200/300 expandability and flexibility; just two reasons to call an MPC distributor today.

MPC Hardware Features:

- Powerful 16-bit architecture
- Virtually unlimited upgrade potential
- Up to: 1 mb memory per station
320 mb disk storage per station
16 stations per cluster
- Standalone or clustered processing



With over 60 locations worldwide, MPC provides complete maintenance on all products offered by MPC directly and through an MPC distributor.



Contact Your Nearest MPC Distributor

■ **Kierulff Electronics:**
Call your Kierulff Division,
(outside Calif
800-338-8811)

■ **Computer Peripherals Inc.,** Richardson, TX
(214) 644-3606

■ **Digital Solutions, Inc.,** Marietta, GA
(404) 955-4488

■ **Dayton-Forrester Associates,** Canoga Park, CA
(213) 701-0127

■ **Pro Com Sales,** Elk Grove, IL
(312) 860-1028

■ **The Tricom Group,** Hicksville, NY
(516) 681-1222

■ **MIDCOM COMMUNICATIONS, INC.,** Southfield, MI
(313) 353-5696

■ **Computer Dataco Inc.,** Kansas City, MO
(816) 221-1212

■ **Peripheral Business Systems,** Kirkland, WA
(206) 823-6661

■ **Peripheral Equipment,** Pleasant Grove, UT
(801) 785-5009

■ **Dynamic Systems North West,** Mukilteo, WA
(206) 745-5311

■ **RC Data Inc.,** San Jose, CA
(408) 946-3800

■ **Trans Alaska Data Systems, Inc.,** Anchorage, AK
(907) 561-1776

■ **Andor Systems,** Ontario, Canada
(416) 746-2775

a division of C3 Inc.



Micro Products Company
Rte. 634 & Acacia Lane
Post Office Box 198
Sterling, Virginia 22170
Telex: 910759
Phone: (703) 430-1800

Barry Morgan - C3 Inc.
Kingswick House
Sunninghill,
Berkshire England SL57BJ
Telex: 848980
Tel Ascot (0990) 23491

THE COMPLETE BRANCH OFFICE

- | | |
|---|---|
| <input checked="" type="checkbox"/> Luxuriously furnished | <input checked="" type="checkbox"/> Prestigious address |
| <input checked="" type="checkbox"/> Completely staffed | <input checked="" type="checkbox"/> Short term agreement |
| <input checked="" type="checkbox"/> Fully equipped | <input checked="" type="checkbox"/> No capital investment |

All included when you lease from OmniOffices.

Atlanta (404) 256-0009	Houston (713) 965-0060
Chicago (312) 843-2500	New York (212) 867-5750
Dallas (214) 233-6664	San Francisco (415) 391-8810
Denver (303) 770-1000	Washington, D.C. (703) 821-8950

Or write for brochure:
S. Wilson, Leasing Manager
OmniOffices, Inc.
5775-E Peachtree Dunwoody Rd., NE
Atlanta, GA 30342

OMNIOFFICES

Attorney Draws Antitrust Litigation Bottom Line

By Patricia Keefe

CW Staff

BOSTON — The bottom line in antitrust litigation is "the issue of whether one views antitrust law as based upon the protection of the economy or as having the social context of protecting small businessmen," according to Richard A. Horning, a computer law attorney.

Horning, who spoke at a recent meeting of the Boston Bar Association's Computer Law Forum, detailed his views on antitrust litigation involving IBM and AT&T.

"The IBM case was untenable from the start," Horning said, adding that consistency in defining the market as held by IBM was a problem.

The antitrust suit was filed in the last days of the Johnson administration, and there was a commitment within the Justice Department to carry the case forward.

"Until [Assistant U.S. Attorney] General Baxter came along, no one had taken a hard look at this thing they were prosecuting to see if it was in the interest of the country, both in terms of the U.S. economy and in an international setting," he said.

He cited the case of U.S. District Court Judge David N. Edelstein, who he said had "invested a fair amount of time" in the case and "did not want to let it go," despite a request from IBM that he disqualify himself from post-trial hearings [CW, May 24, 1982].

How the IBM case and antitrust in general have been pursued has varied under different presidents' administrations. Baxter, under the Reagan administration, looked at the IBM case from the "standpoint of 'what is solid economic policy for the country as a whole?'" Horning said, and "bigness is not badness per se." Horning compared Baxter to Thurmond Arnold, his predecessor in the 1940s, who believed "big is bad" and that smaller businesses, "farmers and mechanics," must be protected.

Where the AT&T vs. the Justice Department antitrust case was settled out of court, Horning said the question now "is whether things are better off." Economic analyses of communities where the phone company

experienced competition have shown that on the whole, consumers seem to have benefited, he said.

In addition to inducing competition in the long lines arena, the breakup of AT&T "represents an enormous potential force in the computer industry," Horning said.

Horning also addressed the Microelectronics and Computer Technology Corp. (MCC) [CW, Jan. 31], a multivendor research and development consortium. MCC has received the Justice Department's blessing, which likely rules out any government-initiated antitrust actions. Horning said there are bills pending in Congress that would further immunize the consortium against antitrust suits filed by private parties.

Supershorts

Dataguard, a division of Novo Communications, Inc., has established a facility in Framingham, Mass., that will offer high-security data storage and retrieval services for companies within a 50-mile radius. Operations are scheduled to begin July 1.

Teknekron Industries, Inc. has completed the purchase of Data-point Corp.'s Communication Management Division. The division will continue as a new company, Teknekron Infoswitch.

Honeywell, Inc. has established a new center for the sale of digital integrated circuits to outside customers. The Digital Products Center, headquartered in Colorado Springs, Colo., and part of the Semiconductor Group, will sell custom, semicustom and noncommodity products.

The Advanced Technology Development Center of the Georgia Institute of Technology and the Georgia Tech Alumni Association are sponsoring the Atlanta High-Technology Venture Capital Conference, Oct. 13 and 14, at the Peachtree Plaza Hotel, Atlanta. Details of the conference are available from Bettye Parker, Department of Continuing Education, Georgia Institute of Technology, Atlanta, Ga. 30332.

Gould, Inc. has reached an agreement with Intel Corp. to make and supply the uninterruptible power systems for Intel's Fest-3825 semiconductor disk system.

Comdisco Disaster Recovery Services, Inc. (CDRS), a subsidiary of Comdisco, Inc., has announced a business arrangement with EMX Telecom, a partnership between Mitel, Inc. and American Satellite Co., under which EMX Telecom will provide communications capabilities beginning in 1984 to support CDRS' disaster recovery services.

Digital Equipment Corp. and VSLI Technology, Inc. (VTI) have signed a cooperative agreement to market Digital's VAX superminicomputers and software developed by VTI for VSLI design.

Information on the Firing Line



DPMA

Baltimore '83

Join us in Baltimore, October 30 through November 2, 1983, at Data Processing Management Association's Baltimore '83 International Conference and Business Exposition where "Information is on the firing line." There'll be three information packed days of seminars, workshops and panel discussions; plus a dynamic business exposition of the latest in computers and office automation, all under one roof at the Baltimore Convention Center.

The Conference highlights are geared to management needs which will include:

- General Management
- Personal Development
- Getting the Job Done
- Trends and Directions
- Current Technical Concepts
- Office Management Systems



The Business Exposition will showcase products and services by the nation's leading companies including Digital Equipment Corp., Datapoint, Eastman Kodak, American Bell, Burroughs, IBM, Radio Shack and many others.

Stroll Baltimore's historic streets and Inner Harbor that was founded in 1729. Board the USF Constellation, visit the National Aquarium, Fort McHenry and the B. & O. Railroad Museum. Complete your days with a fabulous meal at one of the many Harborplace restaurants.

Education, sightseeing, and great meals all add up to an exciting annual event you cannot afford to miss.

For complete details on DPMA Baltimore '83, fill out the coupon below.



Send to: DPMA Baltimore '83
505 Busse Highway, Park Ridge, IL 60068-3191

A

DPMA
Baltimore '83
Information On The Firing Line
October 30 - November 2

Please send:

- ☐ Conference registration materials
- ☐ Free exhibit-viewing tickets
- ☐ My company's interested in exhibiting
- ☐ Send exhibit information
- ☐ Membership information

Name/Title

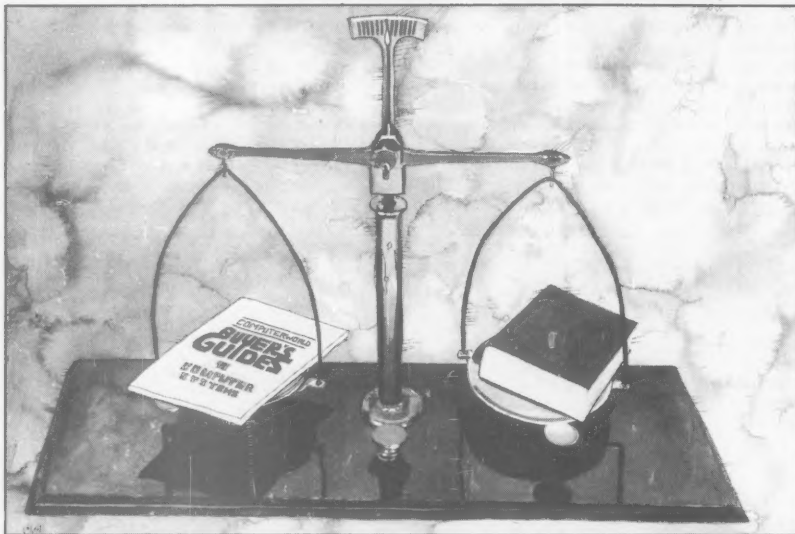
Company

Address

City/State/Prov./Zip-Postal Code

Telephone

**Weigh the difference.
Now everything you need to know
to find the right systems hardware
is in one concise book:**



“Computerworld Buyer's Guide to Computer Systems.”

Choosing the right systems hardware for your organization can be a difficult task. To make the right purchase decisions you must be well-informed on the constant flow of new products and applications caused by rapidly changing technology and the ever-growing number of vendors. The *Computerworld Buyer's Guides* provide all the vital information and market data you need in order to make the right choice.

The *Computerworld Buyer's Guide to Computer Systems* is the first in our series of market-specific directories to computer-related vendors, products and services. It will cover the market at the “core” of the computer revolution — the processor — with everything from micros to mainframes.

Complete and concise, the *Computerworld Buyer's Guide to Computer Systems* will offer detailed, all-inclusive listings and up-to-date information on the companies and products in this segment of the market. These listings will be divided into two sections: vendor profiles and product offerings. In addition, there will be articles on topics such as new technology, specific product trends, handy referral charts for representative products in

particular equipment categories and issues in product selection.

In short, the *Computerworld Buyer's Guide to Computer Systems* is the one, easy-to-use reference source that buyers of systems hardware will refer to again and again. As an advertiser, you'll find this guide a uniquely powerful vehicle for telling your story to *Computerworld* subscribers at that crucial moment when they are actively seeking vendors.

The issue date for the *Computerworld Buyer's Guide to Computer Systems* is August 24. Advertising space close is July 8. Watch for the additional guides from *Computerworld* in 1983: *Terminals & Peripherals* and *Software*.

And, remember, the *Computerworld Buyer's Guides* are sent *exclusively* to the more than 111,000 *Computerworld* subscribers in the U.S. One more good reason to subscribe to *Computerworld*.

For more information on the *Computerworld Buyer's Guides*, call Kevin McPherson at (617) 879-0700 or your local *Computerworld* sales representative.

COMPUTERWORLD
BUYER'S
GUIDES

ADVERTISING CLOSE: July 8th

BOSTON/Chris Lee, Ed Marecki, Joe Fitzhugh, Jim McClure, Kathy Doyle, Diane Sukey, (617) 879-0700
CHICAGO/Art Kossack, Newt Barrett, Chris Lee, Jean Broderick, (312) 827-4433
NEW YORK/Mike Masters, Doug Cheney, Ray Corbin, Joan Daly, Fred LoSapio, Gale M. Paterno, (201) 967-1350
ATLANTA/Jeffrey Melnick, Mike Masters, (404) 394-0758
SAN FRANCISCO/Bill Healey, Barry Millone, Theodora Franson, A.G. Germano, Eileen Dunn, Ruth Gordon, (415) 421-7330
LOS ANGELES/Jim Richardson, Bob Hubbard, Beverly Raus, (714) 556-6480

Forecasts & Findings

'Nuke Fear' to Spur Optics

Fears of a major disruption of national communications networks in the event of a nuclear war are expected to spur tremendous growth in the fiber-optic cable market, which is expected to be worth over \$2 billion in 1992, according to **Fiber Optic Markets**, by International Resource Development, Inc. (IRD).

A major reason behind this growth is said to be encouragement from the U.S. defense establishment due to concern over electromagnetic pulse (EMP), an effect of a nuclear explosion which reportedly can render military communications, electronic power grids and civilian phone systems useless during a nuclear war. However, fiber-optic cable devices could have the effect of arresting the EMP surge before it could create any damage. In addition, fiber optics systems have plenty of transmission capacity, will become cheaper to install, offer small size, weight and indefinite service life and can be buried underground, offering another line of defense against EMP, IRD said.

The report (No. 557) is available for \$985 from IRD, 30 High St., Norwalk, Conn. 06851.

Videodisk Mart to Explode

The market for read-only videodisks is expected to reach an installed base of \$5.9 billion between now and 1990. For read/write systems, an installed base of \$1 billion in optical disk drives for data storage by 1990 is predicted, while optical imaging systems are expected to generate sales of \$1 billion in 1990 alone (15% of the total 1990 micrographics market), according to **Optical Disc Systems**, by the Yankee Group.

Due to problems of quality control and overstated sales projections, the videodisk has stumbled in its early market years, the report said. But over the last year, it has shown "some promising signs" of recovery. The consumer market and industrial training and merchandising marts offer the largest potential for sales, according to the Yankee Group. The optical disk is expected to function primarily as a replacement for magnetic tape in data processing environments, offering the advantage of on-line mass storage. Also, the report predicts that optical disk drives will not be fully plug-compatible peripherals until 1986. Optical systems reportedly will replace computer output microfilm and computer-aided retrieval systems by almost 40% of annual sales by 1990.

Divided into two parts, **Videodisks and Optical Data Disc Systems**, priced at \$1,950 each, the study is available from the Yankee Group, located at 89 Broad St., 14th Floor, Boston, Mass. 02110.

Electronic Info Growth 23%

The gross distribution revenues in the North American market for the electronic sale of information was \$1.047 billion last year, and an overall industry growth rate averaging 22.8% can be expected for the next five years with the aggregate market exceeding \$2.9 billion in 1987, ac-

cording to **Electronic Information Industry Forecast: North America**, by Link Resources Corp.

These findings show an increase in overall distribution revenue of 14.6% per year — up from \$796.5 million in 1980. Business information accounted for 76.8% of the total distribution revenues in 1982 and is expected to grow at an average annual rate of 20.6%, reaching \$2.062 billion in 1987. Professional information services follows with 13.6% (\$142.3 million) of the total in 1982, reaching \$476.4 million in 1987. Science and technical information and library support services accounted for another 8.2% (\$85.6 million) of the total, which is expected to reach \$178.5 million in 1987.

Nonclient companies can purchase the report for \$2,000 from Link Resources, 215 Park Ave. S., New York, N.Y. 10003.

Services Mart Untapped

The market for on-line information services is still largely untapped in many business/occupational categories, according to **Business Users of Electronic Information Services**, by the Link Consulting Group. The average penetration of electronic information services across a total user sample containing nine occupational categories in three major industrial groups is estimated at between 10% and 15%.

The greatest information service

use was found among lawyers in firms where 42.5% employ some form of on-line service. Brokers report the highest average 1982 departmental budgets for data base services at \$59,000, while the lowest budget was reported among company lawyers, averaging \$17,000. Both brokers and lawyers consider system reliability the most important aspect of data base service, while quality of information was rated most important among the other occupational categories. Although the 1982 mean budget was \$45,000, 1983 estimates were lowered to a mean of \$38,000. This decrease is attributed to both the tight economy prevailing during the course of the survey and a general

(Continued on Page 61)



A communication network is as strong as its weakest link. Get the facts.

The person who plans and acquires your company's network equipment and services can make or break the chain that links your DP and OA systems.



Selecting the right services and equipment requires up-to-the-minute information and practical advice about the products, issues, problems and opportunities. Now, the information you need to plan your communication network strategy is available in an exciting video format: the **Conference Journal. Communication Networks: Alternatives for the '80s** and **Local Area Networks: The Major Considerations** address the ins and outs of networking. Jointly developed by DELTAK and CW Communications, the Journals were taped on location at the fifth annual Communication Networks conference and are available only from DELTAK, the world leader in video-based DP training.

Communication Networks: Alternatives for the '80s.

In five 20-30 minute color video sessions, you'll hear from industry experts FCC Chairman Mark Fowler, American Bell/AIS President Arch McGill and Dr. Dixon Doll, along with others, sharing their insights on topics such as short-haul microwave, PBX technology, communications processors and satellite technology.

Local Area Networks: The Major Considerations.

In this Conference Journal, data communications pioneer Dr. John McQuillan is joined by Diana Last and Drs. Kenneth Thurber and Howard Frank. Four video sessions focus on the capabilities and architectures of LAN communications: the baseband vs. broadband debate, choosing the best system for your needs, flow control, and diagnostic network monitoring.

Plan a successful communication network. Order the Conference Journals today. To order, call DELTAK at 800.532.7686. In Illinois, call 312.369.3000.



DELTAK



CW COMMUNICATIONS, INC.

Computerworld Buyer's Guides are a new type of reference source for the computer-involved professional. CW Buyer's Guides are broken down by topic, for easy reference, and include useful articles on that issue's topic, as well as complete company and product listings. With thousands of companies and tens of thousands of products now in the computer market, and new ones becoming available every day, these guides can be an indispensable reference

With all this information at such a low price, there has never been a better time to get off the pass-along list and onto the subscriber list. Get your own subscription to *Computerworld*, and get the information you need *when you need it*.



THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

114

Forecast & Findings

(Continued from Page 59)

estimates. Also by 1992, the keyboard will have become the center of office activity as one of every two white-collar workers will have a computer. It is estimated that in contrast to the \$2,500 spent per worker for computer equipment in 1982, that figure will increase to \$9,000 in 1992. Sales

will include CRT terminals, personal computers (3.2 million units in 1987) and word processors, where a change in emphasis is expected from the stand-alone unit to cluster systems.

The report (No. G-057) is priced at \$975, available from BCC through P.O. Box 2070C, 9 Viaduct Road, Stamford, Conn. 06906.

Desktop Faxes to Blossom

High-speed desktop machines will be the fastest-growing segment of the facsimile equipment market, with about 25% annual real growth projected through 1987, according to **Facsimile Equipment Market**, by Frost & Sullivan, Inc. However, with some models leasing for well under \$150/mo, market profitability is said to be rapidly shrinking.

Overall, the \$389 million (1982 sales) facsimile industry, which once promised the same kind of quantum growth that the copier business has experienced, has fallen short of expectations primarily due to leasing policies, the report said. Currently,

the industry leases more than 75% of its new machines, and despite efforts to get customers to buy, rapidly changing technology along with high interest rates reportedly have made leasing more appealing. Also, by 1987, high-speed units are expected to garner 56% of the market with Japan leading the way, as it does now in most of the facsimile industry. Further, the study states that the future of the industry "lies primarily in stand-alone machines and networks sending business documents to other similar machines."

The report (No. 951) costs \$1,350 from Frost and Sullivan, Customer Service, 106 Fulton St., New York, N.Y. 10038.

Executive Corner

• **Arthur Honegger** has been named president of Data Magnetics Co.

• **Dr. Jerrold A. Heller** has been promoted to senior vice-president, video products, at M/A-COM Linkabit, Inc., a subsidiary of M/A-COM, Inc.

• **Dieter E.A. Tannenberg**, president of the Multigraphics Division at AM International, Inc., has been named a senior vice-president of the company.

• **Harold F. Enright Jr.** has been named president of the Computer Aided Design and Manufacturing Business Group at Prime Computer, Inc.

• **John Garcia** has been promoted to vice-president of software at Data-soft, Inc.

• **William W. Chorske**, senior vice-president, Data Systems Group, has been named group executive, Optical Group, and **James K. Sims**, vice-president and general manager of the Sales and Service Division, has been appointed group executive, Data Systems Group, at Perkin-Elmer Corp.

• **Stephen N. Bowen** has been named vice-president, communications, at NCR Corp. **William J. Gotschall**, president of NCR Comten, Inc., has been named a vice-president of NCR Corp.

• Zentec Corp. has announced the appointment of four senior vice-presidents. They are: **Lawrence G. Finch**, product management and engineering; **Neal Dempsey**, marketing; **Jeffrey Thwaite**, operations;

and **Tim Conley**, finance and administration.

• **Richard L. Henander** has been appointed vice-president of finance and chief financial officer at Intecom, Inc.

DISCOVER THE DYSAN DIFFERENCE

Pack All Your Troubled Packs and Cartridges in an Old Kit Bag

And Save. Save. Save!



SPECIAL LIMITED OFFER. DOUBLE TRADE-IN VALUE:

If you act now, you can receive twice the trade-in credit you normally earn toward the purchase of Dyan's superior quality disc packs and cartridges. So, pack up your old disused disc packs and contact Dyan by July 31, 1983.

Need more information? Call your nearby Dyan Representative or use our toll free 800-551-9000 number. Or simply fill in the coupon. Discover the difference Dyan's precision magnetic media can make. For your system and your budget.

Dyan
CORPORATION
Corporate Headquarters
5201 Patrick Henry Drive
Santa Clara, CA 95050
(800) 551-9000

SPECIAL LIMITED OFFER!

CW 7/4

- ☐ Yes, I'm interested in Dyan's Double Trade-In Value Offer.
- ☐ Yes, I'd like a free copy of your rigid media service brochure.

Name: _____
Company: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: (____) _____

Mergers & Acquisitions

Tymshare, Inc., Cupertino, Calif., has acquired **DMI Systems, Inc.** of Lyndhurst, N.J. Terms of the acquisition were not announced.

Planning Research Corp. (PRC) will purchase **Sterling Systems, Inc.** of McLean, Va., from its founder, **Robert L. Quinichett**, for an undisclosed amount of cash. Sterling Systems will be operated as a PRC subsidiary.

Automatic Data Processing, Inc. (ADP) will acquire **Computer Information Service, Inc.** of Chicago, Ill., for an undisclosed number of ADP shares of common stock.

AGS Computers, Inc. has completed the acquisition of **Disc, Inc.** of Baltimore, Md.

POSITION ANNOUNCEMENTS

DATA PROCESSING PROFESSIONALS

DATA RESOURCE CORPORATION, headquartered in Atlanta, is a leader in quality Contract Programming and Consulting. Our continued growth in the Southeast and Southwest has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design.

We are currently seeking individuals with at least 3 years of diversified programming experience, strong technical backgrounds and who possess the desire to work in various stimulating Data Processing environments. IMS and CICS skills are of special interest, as are the abilities to travel or relocate.

We can offer you competitive salaries and comprehensive benefits programs, including bonuses and profit sharing. If you've been searching for a growth opportunity with a dynamic and progressive company with a Management team that puts people first, then DRC is your answer.

For immediate consideration, please call BECKY FINLEY at 1-800-241-6002, or send your resume to:

DRC

DATA
RESOURCE
CORPORATION
3301 Buckeye Rd.
Suite 103
Atlanta, GA 30341
(404) 455-7260
An EOE M/F

MANAGER PROGRAMMING & SYSTEMS DEVELOPMENT FOR A LIBERAL ARTS COLLEGE

Search has been reopened for an individual who will report to the Director of the Computing Center and will be responsible for directing the activities of a group of programmer/analysts in developing, enhancing and maintaining the colleges information systems.

The successful candidate will assume the leadership for system design, programming and implementation of on line administrative systems. Qualifications to include a Master's degree with demonstrated skills in management in a university or college environment. Hardware includes: IBM 4341 group 2 with 4 meg storage. Operating system is VM/SP & DOS/VSE. Experience in education, data base and teleprocessing environments and knowledge of PL/I or COBOL is highly desirable. Salary commensurate with experience and education, and is highly competitive with industry. Excellent fringe benefits. Iona College is a liberal arts college, located 20 miles from N.Y.C. with strong commitments to computer related curricula. Closing date for applications is July 8, 1983. Reply to:

ANTHONY S. HALARIS, DIRECTOR
IONA COLLEGE COMPUTING CENTER
715 NORTH AVENUE
NEW ROCHELLE, N.Y. 10801

An equal opportunity
affirmative action employer

Data Processing Professionals

**Comerica, Inc. is
staffing now
for an expanding
Information
Systems
Department**

And we need computer professionals for these positions:

- MVS Console Operators
- Production Support Specialists
- Data Base Analysts
- Project Managers & Leaders
- Systems Analysts
- Data Processing Consultants
- Information Center Specialists
- Network Engineering
- Development Center Specialists
- Technical/Systems Education Coordinators
- Programmers & Programmer/Analysts
- Systems Programmers
- Office Automation Experts
- Voice Communications Analysts

Experience levels for each position vary, beginning with a minimum of 1+ years' experience. You'll work in a state-of-the-art environment that includes:

HARDWARE: IBM, 3083, 3705, 3380, Tandem, Micro Systems - IBM PC, Tektronix Graphics Systems

SOFTWARE: OS/MVS, JES2, TSO/SPF, VM/CMS, IDMS, CICS, NCP/VTAM

ENVIRONMENT FEATURES: HOGAN Financial Systems, On-line Applications, Data Dictionary, COBOL, FORTRAN, ACF-2, UCC Products, Panvalet & Easytrieve, FDR, Phoenix, Performance Monitoring, Capacity Planning, SAS, Culprit, ADS On-line, On-line English, On-line Query, Micro Software, Office Automation Software, System Prototyping, SNA/SDLC.

Projects include the use of Data Base and Data Communications on large scale IBM mainframes, and ground floor development of progressive Office Automation and an Information Center.

When you join Comerica, you're joining Michigan's most progressive financial institution. We offer a very attractive compensation package depending upon experience, flexible fringe benefits including a range of BC/BS or HMO plans, child care and tuition reimbursement, and career development programs.

If you're interested in a challenging data processing career with Comerica, please forward your resume in confidence to: Personnel Department, Comerica, Inc., P.O. Box 54636, Detroit, Michigan 48264.

Equal Opportunity Employer M/F/H/V

Comerica
INCORPORATED

MANAGER, ADMINISTRATIVE AND CLINICAL COMPUTER SYSTEMS

From the time of its establishment as the nation's first teaching hospital to its current position as an internationally recognized university hospital, the Hospital of the University of Pennsylvania has bred the expectation of innovation and excellence. The Department of Radiology is seeking a computer professional experienced in organizational information management to direct, control and plan for the Management and Clinical Computer Systems in Radiology, including the Management Computer System and the systems used for Nuclear Medicine, office automation, financial and personnel management, and network interfaces. Demonstrated supervisory skills and systems and applications programming experience with DEC computers are required. VMS, MUMPS and networking knowledge is strongly preferred. The ideal candidate will also hold a Master's Degree in Engineering, Computer Science, Mathematics or a related field, although equivalent experience will qualify.

At the Hospital of the University of Pennsylvania we select the best qualified individual, define the expectations, provide appropriate support and achieve anticipated results. Naturally, we compensate accordingly with a competitive salary and comprehensive benefits. For immediate consideration forward your resume and salary requirements, in confidence, to Barbara Mihatev, HUP Recruitment, 3400 Spruce St./G1, Philadelphia, PA 19104. An equal opportunity employer. M/F/H

HUP

HOSPITAL OF THE
UNIVERSITY OF
PENNSYLVANIA

DATA PROCESSING MANAGER

Our client, a New England-based service organization, is seeking a seasoned professional for their Data Center. This position reports to the Director of MIS and has responsibility for the Operations and Technical Services group. A solid technical background in an IBM mainframe environment and prior managerial experience are required. Full relocation package available. First years earnings to \$48,000.

SR. SYSTEMS PROGRAMMER

Our client, a rapidly expanding Fortune 500 firm is seeking a talented individual for this key position. Experience in an IBM OS environment required. MVS and conversion experience are a definite plus. Full relocation. First years earnings to \$40,000.

ffortune

Personnel Consultants of
Nashua
154 Broad St. Dept C.
Nashua, NH 03063
603-880-4900
Company Paid Fees

CAREER OPPORTUNITIES FOR SOFTWARE PROFESSIONALS COME GROW WITH GAI

GALLER ASSOCIATES, INC. (GAI), is a twelve year old international consulting and software development firm. We are seeking career-minded ADP professionals with a minimum of 3 years experience for challenging technical assignments and career growth opportunities. We offer excellent salaries and fringe benefits. We have openings for:

APPLICATIONS PROGRAMMERS/ANALYSTS
Orlando, Florida - IBM 4341: PL/1, FOCUS, IMS, CICS

SYSTEMS PROGRAMMERS
San Antonio Texas - IBM 4341: VM/VS1
Washington, D.C. - HONEYWELL: GCOS-3/GCOS-8

If you have the skills and the desire to join a solid, growing company, call now, or send your resume and salary history to:

GALLER ASSOCIATES, INC.
1000 Wilson Blvd., Suite 2105
Arlington, VA 22209
(703) 525-9292
Attn: Ms. B. Gibson

PRINCIPALS ONLY

EOE

Whatever the question, if it relates to software, the answer is Cullinet, the established leader in the software age. As the single vendor source that has emerged to meet the software needs of business, Cullinet anticipates the challenges of the new era and stands ready to articulate the answers.

As we lead the way into the software age, we seek talented professionals to join us in defining the way the world will work.

Cullinet

is the answer

APPLICATIONS SUPPORT

Manufacturing and Financial Applications Managers

Pre-sales and Post-sales

Requires manufacturing or financial experience, preferably from both the software vendor and customer perspective. Pre-sales will assist sales account managers closing financial systems/manufacturing systems sales. Responsibilities include sales presentations, customer surveys, responding to requests for proposal, system demos, etc. Post-sales to work with customers as primary contact through all phases of implementation of financial systems/manufacturing systems. Responsibilities include implementation planning, system training, system reviews. Positions require well developed communication skills, database experience, excellent organization and follow-through skills. Financial positions require experience in accounts payable, accounts receivable, general ledger or other financial applications. Manufacturing positions require BOM, INV, MRP, or other applicable manufacturing applications experience. Extensive travel required.

TECHNICAL/SALES SUPPORT

Data Center Sales Support

In this important role, the successful candidate will assume responsibility for sales support and software marketing support, including 20-30% travel to field sales and technical support locations. To qualify for this opportunity, you must possess a minimum of 3-5 years' experience in the following areas: marketing support, data service bureau sales, data communications, IBM mainframe, database on-line systems, and COBOL. Excellent communication skills are essential. A Bachelor's degree in Computer Science or Business Administration is required.

Technical Support Specialists

Database Systems Data Dictionary On-Line Systems Microprocessor Audit Retrieval

Positions require experience with a large scale IBM environment. IBM Assembler and/or COBOL is a must with experience in database and on-line systems. In addition, excellent communication skills are required.

Account Managers

Marketing positions are also available for experienced Software Sales Professionals.

SYSTEMS SOFTWARE DEVELOPMENT Software Engineers

IDMS/R

Database Development

Opportunity to work on utilities, compilers, and database recovery systems. Requires a minimum of 3 years' experience with DB Management Systems.

Data Dictionary Development

Apply your expertise to data dictionary systems and language compilers. Requires a minimum of 2 years' experience with data dictionary systems and/or database management systems.

Applications Development Systems (ADS)

Develop programmer productivity aids, on-line screen mapping services, and code generation techniques. Requires a minimum of 2 years' experience in the development of systems level software. DB background essential.

ESCAPE

Reporting to the development staff, provide customer support by telephone and in the field in the use of our ESCAPE product and assist in the development of product enhancements. Requires several years' experience in either IMS or DL/I and Assembler language on IBM mainframes. Specific knowledge of IDMS or CICS would be a plus. Success in this role demands strong interpersonal skills and some user contact. Position involves some travel.

Software Maintenance Control Technician

To qualify for this position, you'll need a working knowledge of JCL demonstrating experience using IBM large mainframes, polished technical editorial skills, and well developed written, oral communication and organizational skills.

Information Database Development

The qualified candidate for this position will need database background, familiarity with connections between IBM mainframe and personal computers, a minimum of 2 years' experience with mainframe systems software and some experience with personal computers.

APPLICATIONS SOFTWARE DEVELOPMENT

Software Engineers

Challenging opportunity to develop a fully integrated set of manufacturing and financial products in an on-line database environment. Requires a minimum of 2 years' applications development experience. Database and on-line experience desirable.

Financial Systems

Participate in the development of general ledger, accounts payable, purchasing order entry, accounts receivable, all integrated in an IDMS DB/DC environment.

Manufacturing Systems

Development of bill of material inventory control, MRP, shop floor control and master production scheduling. Fully integrated with the financial systems.

Corporate MIS

Development of a set of applications built around an integrated corporate database. The MIS Group is in the early stages of providing applications in a rapidly growing and changing environment.

MICROPROCESSOR SOFTWARE DEVELOPMENT

Designers/Applications Programmers

Participate in the integration of micros with mainframes. Requires a minimum of 2 years' current microprocessor programming experience in C, PL/I and Pascal. Solid background in one or more of the following is essential: electronic spread sheets, financial modeling, color graphics, IBM communications.

To explore these exciting opportunities, please send resume with salary history to C.H. Levy, Dept. CW-74, Cullinet, 400 Blue Hill Drive, Westwood, MA 02090.

An Equal Opportunity Employer

Cullinet

The answer is software . . .
and software is Cullinet.

position announcements

position announcements

position announcements

position announcements

position announcements

Data Processing

IBM TRAINING SPECIALISTS

As one of the world's largest information services companies, Computer Sciences Corporation has taken a solid leadership position in the development of technically advanced software systems.

At the Systems International Division of CSC, located in Herndon, Virginia, our continued growth in the development of sophisticated turn-key systems for foreign governments has created immediate requirements for IBM training specialists.

Selected individuals will provide course curriculum development of software-related training materials. In addition, the individuals will provide classroom instruction of foreign expatriate students on the utilization of the IBM 43XX system.

Qualifications include a B.S. degree in Computer Science or related field coupled with a minimum of five years training experience encompassing computer programming applications, IBM mainframe (370 or larger) systems, and directly applicable teaching experience.

To learn more about these exciting opportunities, our excellent salaries and comprehensive company-paid benefits, please call/forward your resume in confidence to Paul Gorey, Senior Personnel Administrator, on (703) 471-3206/7.

CSC

**SYSTEMS INTERNATIONAL DIVISION
3001 Centreville Road
P.O. Box 745
Herndon, VA 22070**

Equal Opportunity Employer

Software Professionals

APPLIED DATA RESEARCH, the world's oldest and largest independent software products company, is seeking software professionals for employment in Dallas or Princeton with experience in one or more of the following:

Software Development

- IBM systems software development using IBM Assembler and Macro Language
- Personal/Micro Computer software development using 'C' language
- Data Base/Data Communications software development

Software Support

- Systems software positions available for both intermediate and senior level personnel in software product support.

For confidential consideration send a resume, including salary requirements, to Mr. E.D. Smith, Director of Technical Recruiting, APPLIED DATA RESEARCH, INC., Route 206 & Orchard Rd., CN-8, Princeton, NJ 08540.



**APPLIED
DATA
RESEARCH**

An equal opportunity employer

Give us your resume

We'll give YOU San Francisco!

Some people come to sail on the Bay, some to ski in the Sierras, and some to snorkel in Santa Cruz. But the professional climate is the real reason, and every bit as exciting.

There's nobody better qualified than CRG to introduce you to San Francisco. We've been here longer—over 10 years—know everyone in EDP worth knowing, and our list of client companies reads like the Who's Who of the business world.

Send your resume today, or call. All fees, interview, and relocation expenses are paid by our clients.

Computer Resources Group, Inc.
303 Sacramento St., San Francisco, CA 94111
(415) 398-3535 or 3333 Bowers Ave., Santa Clara, CA 95051,
(408) 727-1656

CRG

**AFFILIATES IN 27
MAJOR U.S. CITIES**

An employer-retained professional placement service

**SYSTEM DESIGNER/
PROJECT LEADER**

Growing D.P. consulting firm seeks individual with 3 years experience in business programming to lead project team through analysis, design and implementation of custom business information systems.

REQUIRED: COBOL OR PL/I Focus, VM/SP and/or IMS, MVS knowledge of structured programming techniques.

Challenging assignments - dynamic work environment, emphasis on learning and extending state-of-the-art, opportunity to grow with & influence company operation, good salary, employee profit sharing and medical benefits.

Call or send resume to:

DATA KINETICS OF NJ, INC.
1101 State Rd., Bldg. M
Princeton, NJ 08540
609-683-0555

**SYSTEMS ANALYSTS
AND PROGRAMMERS
FOR SUNBELT
LOCATIONS**

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

Dunhill

OF CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28211
800-438-2012
(NC Call)
(704) 542-0312

**NEW ENGLAND
IMS/IDMS/CICS**

The recession is past history for New Eng. & a number of fast-growing hi-tech companies are expanding their MIS staffs once again. Many positions exist for technically strong programmer analysts, sys. programmers & data base analysts w/2+ yrs. of IMS or IDMS or CICS. Salaries \$25,000 - \$50,000 (fee paid).

Robert Hall of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200
Personnel Consultants

ACCOUNT ANALYSTS

GESCO, a major computer service and software development company, is currently seeking Account Analysts for our Management and Strategic Migration Department.

Based in Fresno, California and under the overall responsibility of the Software Products Division, your liaison duties will include project status reporting, account administration and providing guidance and support to both GESCO and our client(s). Additionally, assisting the client with strategic and project planning as well as product monitoring and usage will be key areas of responsibility.

Candidates sought must have a minimum of 5 years Systems Analysis within a SAVINGS AND LOAN, BANKING AND/OR THRIFT AND LOAN environment. Your experience should also include technical (software) support experience. Equally important is your ability to be an effective communicator, highly organized, diplomatic, astute and willingness to travel approximately 30%.

Fresno is just three hours from San Francisco and offers an outstanding educational system, climate, clean air and AFFORDABLE housing. We offer a competitive salary and benefits package.

For immediate consideration, please forward your confidential resume, including salary history to:
A.J. Newborne.

APPLICANTS ONLY

gesco corporation

3747 East Shields Ave., Fresno, CA 93726
(209) 224-8373

Equal Opportunity Employer M/F

**QUALITY ASSURANCE MANAGER
(SOFTWARE)**

The Space Telescope Science Institute, located on the Homewood Campus of the Johns Hopkins University is seeking a dynamic and knowledgeable professional to manage quality assurance for its activities within the challenging Space Telescope development and implementation program.

The successful candidate will be responsible for development and implementation of a quality assurance program for ongoing large software development projects, documentation, limited hardware developments and future data operations.

Substantial experience and knowledge of software quality assurance techniques and practices is expected. Background in application of standards, such as DOD-STD-1679A, MIL-S-52779A, MIL-Q-9598, IEEE 730, is expected. Prior experience in project control is desired. At least a Bachelor's degree in engineering, computer science, mathematics, or related field is required. Excellent communication skills and an ability to work cooperatively with scientific functional groups are essential.

ST Sci offers competitive salary, excellent benefit package, including 24 days vacation, 10% employer contribution to fully vested retirement plan; and paid BC/BS. Major Medical and dental.

Please submit salary history and resume for immediate consideration to: Steven Mantegna, Personnel Officer



**SPACE
TELESCOPE
SCIENCE
INSTITUTE**

**Homewood Campus
Baltimore, Maryland 21218**

An Equal Opportunity/Affirmative Action Employer
M/F/H

**MANAGER OF SYSTEMS
AND PROGRAMMING**

An industry leader supplying the world's largest and most sophisticated financial organizations with documents and services, needs a degreed professional to manage its Corporate Systems and Programming section.

We require a strong background in systems analysis and systems management. S/38 (RPG III) experience a real plus. You will have already demonstrated success in implementing advanced interactive systems in a multi-user facility.

Enjoy the challenge and rewards of a headquarters environment, with a stable and steadily growing company. The compensation package is a strong one which includes an attractive salary, direct and deferred profit sharing and executive level fringes. Please send your letter and/or resume to:

VICE PRESIDENT OF HUMAN RESOURCES

**RUDCO
INDUSTRIES, INC.**

30 W. Century Rd.
Paramus, NJ 07652

equal opportunity employer m/f



position announcements

position announcements

position announcements

position announcements

position announcements

NEW HAMPSHIRE MASS/CONN**\$25 - \$60K**Applications and
Systems Software
Micro/Mini/MainframeManagement
Advisory Services Inc.Colonial Office Park
48 Constitution Drive
Bedford, NH 03102
(603) 472-8844Fees and relocation
expenses company paid.**Manager,
Programming Services**

Clarkson College, in Potsdam, New York, seeks an individual to coordinate the development of information processing systems in support of the College's administrative functions. The Manager will head a team of five programmer/analysts, and will interact closely with departmental liaisons, as well as operations, technical support, and computing services groups. A Bachelor's degree is required, coupled with significant experience as a programmer/analyst, preferably in an IBM environment with COBOL and VSAM. Familiarity with PL/I, fourth generation languages, and data base systems is desired. Our present system is an IBM 4341-2, running VM/CMS, OS/VS1, and MUSIC. Clarkson intends to provide the College Community with a comprehensive network of computing facilities, including widespread use of personal computers linked to the central databases. Salary will be commensurate with qualifications and experience. We offer an excellent benefit package, and our employees are encouraged to enter Bachelor's, Master's and Doctoral degree programs. Send resume, with salary requirements, in confidence to: Richard D. Valente, Director, Educational Resource Center, Clarkson College, Potsdam, New York, 13676.

An Equal Opportunity/
Affirmative Action Employer**ATTENTION: REAL-TIME PROFESSIONALS****START-UP A
CHALLENGING CAREER
WITH A MAJOR UTILITY**

Middle South Services in New Orleans is offering you the opportunity to participate in the development and start-up of a Real-Time Control System - our new Bulk Power Management System (BPMS), to be located in Pine Bluff, Arkansas. We expect this entire system to be on-line in mid-1987.

If your experience qualifies our Special Projects and Studies Department is interested in your immediate participation in our state-of-the-art system. Although the positions now offered require travel to some extent, you'll be based in New Orleans. Here you'll find a stimulating, creative environment in which to work and live.

As a stable, major electric utility, we offer an excellent benefits package. Preferred candidates will have a Bachelor's degree in Computer Science, Math, Electrical Engineering or equivalent. A thorough working knowledge of real-time process control computer applications utilized in the electric utility industry is also required.

SUPERVISOR REAL-TIME ANALYSTS will direct a staff in designing, develop-

ing and implementing software and real-time applications. We require 10 years of directly related experience. An extensive background in higher level scientific programming languages is required; supervisory skills are a must.

SENIOR REAL-TIME APPLICATIONS ANALYST must have 6 years real-time experience in the design, implementation and documentation of various real-time application programs.

REAL-TIME SYSTEMS ASSOCIATE ANALYST requires at least 4 years of computer systems experience, with knowledge of design and programming methodology and experience on large computer systems.

DIGITAL EQUIPMENT ENGINEER requires minimum 4 years experience in developing and implementing computer hardware systems. Also, design/specification of integrated computer-based instrument and control systems.

TELEMETERING ENGINEER must have minimum 4 years experience in developing and implementing Telemeter-

ing systems. Plus design/specification of equipment used in integrated digital computer-based instrument and control systems.

For more information, call our toll-free number below, or to apply directly send your resume to: Gary Silbert, MIDDLE SOUTH SERVICES, INC., P.O. Box 61000, New Orleans, Louisiana 70161.

We are an equal opportunity employer. M/F.

1-800-231-4481

In Louisiana call collect (504) 569-4951.

**MIDDLE SOUTH
SERVICES INC.**
THE PROFESSIONALS IN POWER**Senior Programmers,
Burroughs Irvine:****Professional impact plus
Southern California satisfaction.**

When it comes to information management, Burroughs is an international innovator. And our Irvine facilities — in a scenic setting in Southern California's growing Orange County — is right in step. Offering the challenges you want. The stability you need. And the growth that's vital to your career future. We have excellent opportunities for senior programmers in these specialties:

Data Management

Responsible for the design and implementation for a major effort in advanced data management. Candidate should have strong theoretical and implementation background in data base technology (minimum 3-7 years). DMSII experience would be helpful. Opportunities exist in: **Integrated Data Dictionary • Query Languages and Data Modeling • Forms Management and Application Generators • Data Base Management.**

Data Communications

Responsible for the enhancement and support of Burroughs' Generalized Message Control System (GEMCOS). Applicant should have a strong development background and 3-7 years experience in the area of telecommunications monitors, message routing and control systems, or large on-line application development. Knowledge of Burroughs' large systems, GEMCOS, and ALGOL preferred.

We offer competitive salaries, excellent benefits and rewarding assignments in our small team atmosphere. For immediate confidential consideration, please send your resume with salary history to:

Professional Personnel
Burroughs Corporation
Dept. CW-0704
3519 West Warner
Santa Ana, CA 92704

An Affirmative Action Employer M/F

Burroughs**BRYANT BUREAU
HAS THE
COMPUTER PROGRAM
FOR YOU**

If you're not accomplishing your career goals, let us put you in the right environment. Our national database of client companies are continually looking for progressive DP professionals who want to remain state of the art.

HON Sys. Proj. Support	to \$47K
HON Sys. S/W Analyst	to \$35K
HON Sr. S/W Analyst	to \$39K
IBM 4341 On-Line P/A	to \$27K
IBM 4341 CICS, VM Sys/An	to \$33K
IBM 8100 S/W Specialist	to \$29K
BUR 6000/7000 S/W Sppt	to \$40K
BUR 6000/7000 Tech Sppt	to \$44K
DEC VAX Systems Pgmr.	to \$42K
DEC VAX P/A	to \$33K
HP 3000 P/A	to \$35K
HP 3000 Sys/Analyst	to \$38K

To become part of the growth in the 80's, contact the DP Division below.

Bryant Bureau
DP Division
4000 S. Tamiami Trail, S-502
Sarasota, FL 33581

**Placing
Systems Analyst
and Programmers
is our specialty!**
Need We Say More?

CONTACT
Larry Stone or Jimmy Buck
704-375-0600
Call Collect
FOX-MORRIS
Personnel Consultants
1330 The Johnston Bldg.
Charlotte, NC 28281
Clients Nationwide
Of course, all fees paid by client co.

**SATELCO HAS
A JOB FOR A
SYSTEMS PROGRAMMER.**

Satelco is one of America's fastest growing companies in the communications field, so if you want to be part of a team that's out to make history, and have a good time doing it, send your resume today.

IBM SYSTEMS PROGRAMMER

Senior position. Requires 4-6 years demonstrated performance. Ground floor opportunity to lead in a systems "team" environment on IBM 370-158 (OS/VS1) and IBM 3083 E (MVS/SP). CICS emphasis.

**AND A GREAT PLACE
TO ENJOY IT. SAN ANTONIO.****Satelco**

One Satelco Plaza
San Antonio, Texas 78205
(512) 226-5454

Equal opportunity employer. M/F.

Contact or send your resume to: Armando Anaya, Employment Manager.

position announcements

position announcements

position announcements

position announcements

position announcements

REGIONAL PROJECT MANAGER



**** Do you live in any of these locations? ****
 **** Are you a Manager of Data Processing Professionals? ****
 **** Are you a "Big 8" Information Consultant? ****
 **** Are you looking for a challenging ground floor opportunity? ****

G C Services Corp. has positions available for full time Project Managers to coordinate a data processing contract. The Project Manager shall be located in one of the cities denoted on our map and shall act as the top official representing G C Services Corp. to our client.

The Project Manager shall have control of and be responsible for the installation of IBM 4300 hardware and DOS/VSE software, implementation of an online data base computer system with an integrated telephone switch and the on-going support of this environment.

The Project Manager shall be skilled in technical and managerial abilities, a four-year college degree is highly desirable, must have experience and knowledge in COBOL programming, systems design, and in the installation of large systems, and shall have experience as a manager of technical people. We offer an attractive compensation and benefits program. Send confidential resume and salary history to:



G C SERVICES CORP.
 PERSONNEL MANAGER
 DEPT. HOU: HGO: CPW: DGL
 P.O. BOX 2867,
 HOUSTON, TEXAS 77253
 AN EQUAL OPPORTUNITY EMPLOYER M/F

Financial Programmer/Analyst

MAGNETIC
ATTRACTION

Dennison KYBE, a major manufacturer of "magnetic media and media testing/evaluation equipment, is looking to attract a magnetic personality to join our young, dynamic organization.

As the Financial Specialist, you will be the driving force of our financial MIS implementation effort. This highly visible position will put you in direct contact with users, in-house management and other MIS personnel.

A Bachelor's degree with an emphasis in computer science and finance, accounting, or business is required. Two or more years of experience in a production/development environment utilizing structured techniques on HP equipment in both COBOL and FORTRAN is a strong plus.

Highly competitive salaries, complete benefits and relocation packages are all part of the Dennison KYBE tradition.

For more information contact Ann Scruton by forwarding your resume, in confidence, to: Dennison KYBE, 82 Calvary Street, Waltham, MA 02154. We are an equal opportunity/affirmative action employer, M/F/H/V.

EMPLOYMENT SERVICE FOR
PROGRAMMERS AND ANALYSTS

National Openings With Client Companies
 and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide you decide

RSVP SERVICES, Dept. C
 Suite 700, One Cherry Hill Mall
 Cherry Hill, New Jersey 08002
 (609) 667-4488

RSVP SERVICES, Dept. C
 Suite 211, Dublin Hall
 1777 Walton Rd., Blue Bell, PA 19422
 (215) 629-0595

From outside New Jersey, call toll-free 800-222-0153

RSVP SERVICES

Employment Agents for Computer Professionals

CALLING
YOU
INTO
THE
21ST
CENTURY.

Pacific Telephone is leading
 the way into the Information Age!
 Now you can put your data
 processing skills to work in our
 Accounting Organization as a

STAFF ANALYST

and assume full responsibility for
 several very large, complex V.L.I.
 IMS Programs.

You'll be an ideal candidate if
 you've had at least 2 years'
 programming for large scale IBM
 computers, as well as IBM, JCL,
 PL/I, DL/I and IMS experience;
 you'll be particularly attractive if
 you've earned a 4-year technical
 degree and demonstrated
 leadership experience.

Our salaries (to 40K) and
 benefits are excellent. Take
 charge of your future career
 plans. Send your resume to
 Pacific Telephone, Management
 Employment, 44 Montgomery St.,
 Room 1300, Dept. LH-426, San
 Francisco, CA 94104. Positions
 located in Northern California.
 Relocation not provided. No
 Agencies Please. An Equal
 Opportunity Employer.



Pacific Telephone

EDP AUDIT
INSURANCE

A truly outstanding professional opportunity is available for the superior first auditor with solid systems interfacing background. Will be the sole EDP auditor in dept. & will conduct first (no operational) & systems audits. Light travel. Client is top mid-town re-insurance firm. This is a start-up situation; IBM 4331 mainframe in place. Good growth potential & visibility. \$30,000 FEE PAID.

ROBERT HALF
 522 Fifth Avenue
 New York, N.Y. 10036
 212-221-6500 (agency)

DYNAMAC
CORPORATIONINFORMATION AND MANAGEMENT
SYSTEMS DIVISION
IMMEDIATE OPENINGS - \$50K
UNIVAC 1100 OR TANDEM

- TECHNICAL MANAGERS
Development - Design - Implementation
- DATA BASE ADMINISTRATORS
Development - Design - Implementation
- HARDWARE/SOFTWARE SPECIALISTS
Technical Support Univac 1100 -
Tandem 16 Problem Resolution
- COMPUTER SPECIALISTS
Structured Analysis - Structured Design
- PROGRAMMERS-COBOL
Implementation - Maintenance

Positions are located in Lexington Park, Maryland
 (60 miles southeast of Washington, D.C.)
 on the shores of the Chesapeake Bay

EXCELLENT COMPANY BENEFITS
PAID RELOCATION

For more information -- Call Susan COLLECT
 (301) 468-2500 X330

Send Resume Specifying Position To:

Personnel Director
 PAX Project

DYNAMAC CORPORATION
 11140 Rockville Pike
 Rockville, MD 20852

SYSTEMS PROGRAMMER
DOS/VSE & VM/370

HARFORD COMMUNITY COLLEGE has an immediate need for an experienced Systems Programmer. The position reports to the Director of Computer Services. The College is currently running an IBM 4341 with 3340/3350 disks and VM/370, DOS/VSE, CICS/VS, VOL-IE, UFO, SPSS, VSAM, BTAM, etc. The successful applicant will be assigned to work at the Harford County Computer Center approximately one-half of the time on a scheduled basis. The County is running an IBM 4331 with 3340/3370 disks, using DOS/VSE, CICS/VS (Command Level COBOL), ICCF, VSAM, etc.

A Bachelor's Degree is required. Candidates with three years of experience in systems programming in a comparable environment will be given preference.

Starting salary ranges from \$26,700 to \$34,100 (depending on education and experience), plus an excellent benefits program. The maximum salary on the scale is \$39,495. For additional information, call Bob Slawson at (301) 836-4234.

To apply, send a letter of application and a resume of education and work experience to Edward C. Kuhl, Director of Personnel, Harford Community College, 401 Thomas Run Road, Bel Air, Maryland 21014, on or before July 24, 1983.

HCC IS AN EQIAA EMPLOYER.

SHELBY COUNTY GOVERNMENT
SYSTEMS MANAGER

Shelby County Data Center is a large scale Honeywell Shop. We are moving into the most modern hardware, software and development techniques available.

We are looking for a seasoned Manager to lead our Justice Systems Group. Although desirable, experience with Honeywell or Justice Systems is not essential. The successful candidate must have excellent management and systems planning skills.

Minimum Requirements: Ten years data processing experience in a large equipment environment, with four of those years in management.

Salary range and fringe benefits are competitive with industry standards. Entrance salary will be based on the background of the individual selected.

Send Resume by July 18, 1983 To:

SHELBY COUNTY PERSONNEL DEPARTMENT
 100 N. MID-AMERICA MALL, SUITE 901
 MEMPHIS, TN 38103

For more information contact Lloyd G. Dunn at (901) 528-3387.

An Equal Opportunity Employer
 M/F/H

Systems Programmer

We are a medium sized manufacturer with a challenging position for an aggressive Systems Programmer. The individual we are seeking must have experience in generation and maintenance of either DOS/VSE or VM/SP. Knowledge of RSCS, VSAM, CICS, or Data Base is a plus.

Ours is a state-of-the-art environment including an IBM 4341 running VM/SP, CMS, TMS (codeless-type data base), DOS/VSE, VSAM, CICS, COBOL, and PL/I. We have on-line, 48 CRTs, 6 printers, and 2 BTAM teleprocessing lines.

We are located in a small, family-oriented college community in north central Ohio, and offer a good compensation and relocation package.

Please send your resume in confidence to:

Don Cast, Director, MIS & DP,
 F.E. Myers Co., 400 Orange St.,
 Ashland, OH 44805.

Equal Opportunity Employer M/F/H

FACULTY POSITIONS

COMMUNITY COLLEGE IN SEMI-TROPICAL LOWER RIO GRANDE VALLEY has openings for 3 DP instructors to begin Fall, 1983. Positions require bachelor's degree in computer-related field with 3 or more years work experience and proficiency in programming at least two of these languages: RPG or COBOL, BASIC, FORTRAN; master's degree and teaching experience preferred. Salary: 9-month base salary from scale according to degrees and teaching experience. Application deadline: August 1. Submit letter of application, resume, at least 3 letters of reference, and transcripts of all academic work to Alfredo C. Zamora, Personnel Officer, Texas Southmost College, 80 Fort Brown, Brownsville, TX 78520. 512/544-5205. Board of Trustees reserves the right to reject any or all applications. An Affirmative Action/Equal Opportunity Employer M/F/H.

position announcements

position announcements

position announcements

position announcements

position announcements

DEC/VAX SYSTEMS ARCHITECT

State-of-the-Art Software Systems Design

Planning Research Corporation, the world's largest diversified professional services organization, is undertaking one of the most complex distributed systems ever designed. A turnkey project of this significant proportion has never been attempted and will encompass 300 DEC computers (VAX); 10,000 total computers and 30,000 terminals.

There exists a **genuine** opportunity for that broad-thinking, vision-oriented DEC/VAX software architect who has sound expertise in one or more of the following:

- Top down structured design concepts
- DEC distributed database design
- DEC-layered products
- Fault simulation
- Large DEC networking, integration and control
- Microprocessor integration

We are committed to affording you that challenge to advance your knowledge, foster your proven expertise and enjoy the fruition of your concepts as a key member. We invite you to consider becoming a part of the winning team which will design and implement the latest in state-of-the-art hardware clusters, fully automated advanced systems engineering tools for structured programming and predictive modeling for resource utilization and costing. The far-reaching implications for the DEC environment of this massive undertaking are overwhelming.

The compensation package for this special position is truly **superb** and you are encouraged to apply immediately and receive most courteous attention from Ms. Peggy Caine at (800) 336-3772. (In Virginia, call (703) 556-2219.) If you would prefer to send us your resume, please send it to her attention at: Planning Research Corporation, 1500 Planning Research Drive, Dept. PC-1, McLean, Virginia 22102.

prc

Planning Research Corporation

An Equal Opportunity Employer M/F/H/V Principals Only

Consultants, Analysts and Programmers

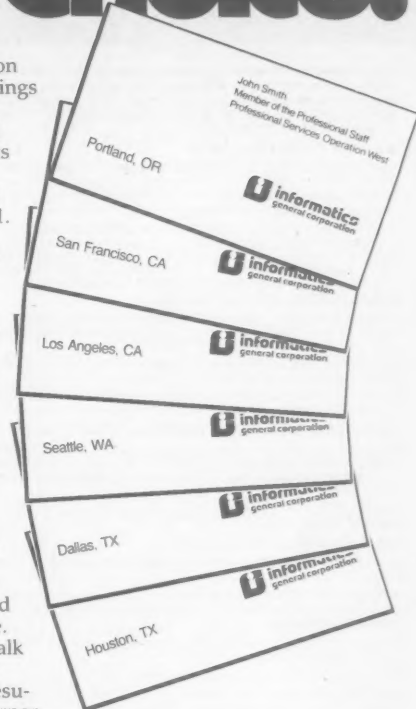
Your Choice.

You can join Informatics' Professional Staff at the location of your choice. We have openings for DP Professionals with growth-oriented technical and consulting skills. Requirements include at least two years of experience on large-scale IBM systems using COBOL or PL/1. It's a plus if you also have experience in IMS, MARK IV or CICS.

Informatics has completed twenty successful years of providing professional services for systems development and consulting projects. Present activity includes development assignments on major state-of-the-art systems for a variety of application areas. The most advanced development techniques are emphasized for all assignments.

If you are interested in a professional career, pick a card for the location of your choice. Call toll free 800-527-4631 to talk with us. In Texas, call collect 214-669-0831. Or send your resume to Informatics General Corporation, 9441 LBJ Freeway, Suite 410, Dallas, TX 75243. We are an equal opportunity employer.

informatics
general corporation



Portland, OR

San Francisco, CA

Los Angeles, CA

Seattle, WA

Dallas, TX

Houston, TX

PENNSYLVANIA HOUSE SYSTEMS ANALYST

Pennsylvania House, a leading manufacturer of quality furniture and a major subsidiary of General Mills, has an excellent opportunity for an experienced Systems Analyst at a salary from the mid to upper \$20's depending on experience.

Our current environment includes an IBM 4341 system running DOS/VSE with CICS/VS for teleprocessing and IDMS as the data base manager. The application environment consists of a mix of packaged software, including AMAPS manufacturing system, and internally developed systems. We require a degree and 3 to 5 years of experience in systems analysis and project management.

Send resume and salary history, in confidence to:

PENNSYLVANIA HOUSE
Personnel Department
137 North 10th Street
Lewisburg, PA 17837

An Equal Opportunity Employer.

ROMAC

Romac & Associates/Personnel Consultants (Agency) specializes in the placement of Data Processing, Accounting, Banking and Financial Personnel. All Fees are paid by our client companies. Below are representative opportunities. Qualified candidates are invited to call or write for appointment. NO RESUME NEEDED. Replies held in confidence.

**SYSTEMS
PROGRAMMER
OS/MVS
\$39,000**

1221 MARINE MIDLAND PLAZA
ROCHESTER, NEW YORK 14604
716-232-4610

WASHINGTON, D.C.

LEARN S/38!

Upgrade your S/34 skills in rural Lynchburg, VA. Must have RPGII; MAPICS is a plus. \$24K.

ROBERT HALF

OF WASHINGTON, INC.
7316 Wisconsin Ave. Ste 401
Washington, D.C. 20014
(301) 952-1980

SOFTWARE DEVELOPERS

The continued growth and success of Goal Systems has opened a number of positions for experienced software developers. We are looking for creative and self-motivated individuals to develop and enhance system software products for IBM DOS/VSE, MVS, and VM operating system environments. Positions are available in the general areas of:

- DATABASE MANAGEMENT SYSTEMS
- COMPUTER BASED TRAINING
- OPERATING SYSTEM EXTENSIONS
- CICS EXTENSIONS
- PERFORMANCE ANALYSIS
- INTERACTIVE SYSTEMS

All candidates must be expert in the IBM/370 Assembler and Macro languages, must be well versed in IBM operating system interfaces, and have detailed knowledge of their areas of interest, including internals where applicable.

If you'd like to put your skills to work doing something significant in a company that is going somewhere, send your resume in complete confidence to:

Mrs. Betty Bruce

Goal Systems International Inc.
5455 N. High St. Columbus, Ohio 43214
(614) 888-1775

**Goal
Systems**

position announcements

position announcements

position announcements

position announcements

position announcements

ZILOG SYSTEMS CHALLENGES THE MINIS!!



Join a leader in the exploding supermicrocomputer market. As a UNIX[®] pioneer, our system is recognized as the leader in price performance. Recent major contract awards have created key opportunities in our dynamic, growing organization. Don't just watch us be successful — be part of it!

Manager, Product Marketing

Develop, implement & manage marketing programs for our new and existing product offerings, with key focus on the European Market. Includes market research, competitive analysis, advertising, promotion, and high level customer interface.

BA with 5-7 years experience, MBA preferred with 3-5 years experience. Marketing experience in commercial, general purpose or office automation mini/micro computer systems. Sales experience, bilingual capabilities, involvement in OEM promotional programs beneficial. Must be willing to travel overseas. **Respond to Dept. 21.**

Manager, Computer Engineering

Develop a new 32 bit supermicro family and enhancements of our existing 16 bit product line, including hardware architecture, CPU and subsystem design and firmware and diagnostics.

Lead a team of skilled engineers in maintaining Zilog systems' position as the price performance leader!

BS/MS EE with 5-10 years microcomputer engineering design and management. **Respond to Dept. 23.**

Q/S Software Development Engineers - UNIX[®]

Zilog was one of the first computer manufacturers to port UNIX V7. We now ship system III and are looking for select engineers to join our leading edge team to port system V and contribute to our continued development of UNIX enhancements.

Experience in UNIX required. BS/MS CS with 2-4 years experience. **Respond to Dept. 25.**

Language Development Engineers

Develop state of the art portable code generation techniques for our integrated family of compilers.

MS/CS with 3-5 years design experience in practical, results-oriented implementations. Expertise in C required. **Respond to Dept. 27.**

Product Engineers

Manage the introduction of our new 16 and 32 bit supermicrocomputer products into manufacturing.

BS/EE or equivalent plus 3-5 years experience.

Knowledge of agency requirements (UL, CSA, VDE and FCC) and microcomputers a must. **Respond to Dept. 28.**

Manager, Application Systems

A ground-floor opportunity to establish and define an integrated application software environment for Zilog system's 16 and 32 bit family of supermicrocomputers.

Also responsible for acquiring and qualifying 3rd party application packages.

Personal and microcomputer applications a must. Knowledge of C and UNIX a plus.

BS/MS CS with 5-10 years in software business applications products required. **Respond to Dept. 22.**

Manager, Material Planning and Procurement

A senior management position in our fast growing manufacturing operations. The charter is to ensure high quality, cost effective materials, on time to support Zilog systems' new product introductions and existing product lines.

A strong team oriented management style required.

BS/IE or BA with 10-12 years of purchasing, materials, traffic and production planning experience in the electronics industry, and certified by APICS (CPIM).

MRP implementation experience a plus. **Respond to Dept. 24.**

Local Area Network Development Engineers

Join a team of senior developers in implementing local area networks for Zilog's current and future supermicrocomputers.

BS/MS EE or CS with 2-4 years experience. Specific experience with Ethernet a plus. **Respond to Dept. 26.**

Send your resume, including salary history, to the appropriate department listed, to ZILOG, Professional Employment, 1315 Dell Avenue,

Campbell, CA 95008. An equal opportunity employer.

*UNIX is a trademark of Bell Labs.

Zilog
an affiliate of
EXON Corporation

Computer Professionals:

Make Your imprint

on a Company-in-Transition

Our Directory/Yellow Pages environment is charged with excitement and anticipation as we expand onto major on-line systems using new Sperry hardware and software, including MAPPER, to support our 1100-70 and 1100-90 Systems.

A variety of positions exist for you if you have:

- COBOL experience on large scale Sperry Systems (1100/80, 1100/60);
- familiarity with Sperry Software, e.g., OS/1100/DMS, TIP, CMS, MAPPER, IRU/MCB/QLP, Assembler;
- 3 years' COBOL experience (application or system internal programming — UNIVAC 1100 preferred);
- a 4-year technical degree (computer programming preferred).

Salaries range from mid-twenties to mid-thirties, depending upon the position you assume and the background and experience you bring to us; our benefits are excellent. So, if you're ready to help us meet challenges beyond the bounds of our imagination, send your resume to:

Pacific Telephone Management Employment Office, 44 Montgomery Street, Room 1300, Dept. LH635, San Francisco, CA 94104. Positions located in Northern California. Relocation not provided. We are an Equal Opportunity Employer. No agencies please.



Pacific Telephone

St. Regis, a Fortune 200 natural resources company, has new and challenging opportunities in its EDP Auditing function based at West Nyack, New York.

SR. EDP AUDITOR

Requires a BS degree in Accounting or Computer Science with a minimum of 3 years experience in auditing, COBOL, OS/JCL systems in an IBM environment. Experience in computer security and user interface is preferred.

STAFF EDP AUDITOR

Also requires a BS degree in accounting or computer science and 1 to 2 years experience in systems and programming in COBOL, OS/JCL environment.

Travel to various nationwide facilities will be at 30% level. Send resume including salary history to: Corporate Employment Services, ST. REGIS CORPORATION, West Nyack Road, West Nyack, NY 10994.

ST. REGIS

EO/AA M/F/H/V

Videotex Advertising Design Supervisor (Computer Graphics)

Communications company is expanding to state-of-the-art computerized videotex operations and implementation. Supervisor for implementation of technical graphics and computerized videotex information systems, \$25,000 per year. Requires four years undergraduate study in Graphic Design plus either one year experience in the position offered or one year experience in alpha-geometric videotex systems. Training of Graphic Designer and staff in Principles of Graphic Design and ensuring that design standards and rules are consistent for visual treatment and are state-of-the-art. Position requires preparation of slide and video presentations, working well within the corporate scheme for implementation of products. Maintains slide and video library and prepares presentations for management approval. Report to Florida State Employment Service, 1350 Northwest 12th Ave., Room 280, Miami, FL 33142-1400. Job order #3001012.

Systems Engineers

Openings in major cities in the
midwest, southwest, and western U.S.

ATM...the financial acronym of the future.

...and what better place to position yourself in this expanding area of financial systems than with NCR — the \$3.5 billion computer leader already well-established in this field and surging ahead with a whole range of sophisticated innovations.

The major focus of your responsibilities will be to support our top sales team in marketing NCR ATM systems to major financial institutions and retailers in these areas. We'll depend upon your state-of-the-art knowledge for effective pre-sale presentations, post sales reviews, as well as customer relations and support. You'll also be providing technical guidance to customers' personnel during systems installation and conducting user training seminars.

Your credentials should include a solid background in communications protocols such as ISO-Asynchronous, 3270 Bisynchronous and SNA/SDLC. A Bachelor's degree in Computer Science or Business and 3-5 years computer systems programming experience as well as good oral and written communications skills are important. Direct experience in an on-line ATM environment would be a plus.

Join a leader in this exciting field and enjoy an excellent starting salary and competitive company benefits. For prompt confidential consideration, submit your resume and salary history to: Ms. Molly DePalma, NCR Corporation, USDPG, 6777 Oakbrook Blvd., Dallas, TX, 75235.

NCR

Complete Computer Systems

An equal opportunity employer

MARYLAND BAY AREA

Career opportunity for experienced Application Programmer on a Burroughs medium scale disk-oriented system. Minimum of 1 to 2 years experience with a financial background. Excellent benefit package. In confidence send resume and salary history to:

Reply to CW-84197
Computerworld
Box 880
Framingham, MA 01701

DP MANAGER Salary to mid 30's

Jacksonville, Florida-based company is seeking a manager to head an IBM system 34 department. The company has experienced significant growth and must enhance or replace several systems to support the growth. The successful candidate will report to the Executive Vice President. Requirements include excellent communications skills, supervisory experience, knowledge of OCL and RPG II as well as possessing management skills. Please submit your resume in confidence to:

Reply to CW-84198
Computerworld
Box 880
Framingham, MA 01701

Just A
Reminder!



Siggraph 83'

Computerworld will be distributing the
July 25, 1983 issue from our booth.

In order to take advantage at this
increased distribution

Reserve space Now

Classified Advertising Deadline is
Friday, July 15th

617-879-0700

1-800-343-6474

SYSTEMS PROGRAMMER

Duties: Implement/monitor operating systems, various programming languages, telecommunications network. Consultant to Programmer/Analysts.

Education: BA/BS in appropriate field (minimum) + 2 years experience on Burroughs B6000/B7000 equipment.

Experience: 1 Year COBOL, + 1 or more of the following: ALGOL, FORTRAN IV, DMS 11.

Desired Background: Database, on-line systems, telecommunication, college administration (preferred).

PROGRAMMER/ANALYST

Duties: Design, implement, monitor various applications.

Education: 2 Year AS degree (minimum) + 1 year of programming experience.

Experience: 1 Year COBOL, or PLI + 1 or more of the following: ALGOL, FORTRAN IV, DMS 11.

Desired Background: Database, on-line systems, systems analysis skills.

These positions are challenging "state of the art" positions; freedom to grow technically. Excellent fringe benefits. Competitive salaries.

Send letter and resume to: Office of Faculty and Staff Relations

4th Floor Administration Building

SUNY College at Brodport

Brookport, New York 14420

Deadline for applications: Wednesday, July 20, 1983

The SUNY College at Brodport is an EEO/AA Employer.

position announcements

position announcements

position announcements

position announcements

position announcements

INFORMATION SYSTEMS ADMINISTRATIVE DATA PROCESSING

LOS ALAMOS NATIONAL LABORATORY

The Los Alamos National Laboratory, a multifaceted research and development facility operated by the University of California for the Department of Energy, has several positions available for Senior Programmer/Staff Member. These positions require extensive experience in developing financial, personnel, and/or materials management COBOL software systems.

Duties and responsibilities include the design, implementation, and maintenance of administrative data processing systems in a structured environment. The development of on-line applications using COBOL operating under CDC, NOS, or VAX VMS, will be oriented toward the administrative end-user.

These positions require extensive professional level experience in data base management for ADP Information Systems. A Bachelors degree or equivalent in Business Administration or Computer Science is required. An M.B.A. is desirable.

The laboratory is located in the mountains of north-central New Mexico. The area offers excellent recreational opportunities that include hiking, camping, fishing, skiing, tennis and hunting. The Laboratory provides an impressive benefits package including 24 days annual vacation and 11 paid holidays.

For interview: John Schroer will be in the Los Angeles area on July 9 and 10, 1983 to conduct personal interviews. To arrange for an interview in the Los Angeles area prior to Mr. Schroer's visit, please call (505) 667-8418 or (505) 667-3666, collect, or contact him in Los Angeles at the AMFAC Hotel, (213) 670-8111 during the interview period between the hours of 9:00 a.m. and 6:00 p.m. If unable to interview, submit resume in confidence to:

Elmer Salazar
Associate Group Leader, ADTS/ADC
Los Alamos National Laboratory, DIV 83-Y
Los Alamos, NM 87545

University of California

Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

An Affirmative Action/Equal Opportunity Employer:
Women, Minorities, Handicapped and Veterans are urged to apply.

Programmer/Analyst Systems Programmer

VITRO Laboratories, a large systems engineering firm with over 34 years of experience, is seeking a qualified CICS Systems Programmer. We need an individual who is willing to help us implement and maintain IBM's CICS/VS package, and provide customer support for this product. The required areas of experience include:

- Installation and maintenance of CICS in an MVS environment utilizing ACF/TCAM/VTAM
- Providing user support in development of CICS applications and implementation of vendor-supplied software products running under CICS/VS
- Coding in ALC and COBOL (or PL/1) using a variety of access methods (ISAM, VSAM)

For this position, you must have a college degree with 7 years of programming experience; or, if no degree, fifteen years related experience, of which at least 11 years are in programming.

VITRO offers a comprehensive benefits package, unique advancement opportunities and job stability. To be considered for this ground floor opportunity, please call **Will Branning, Staffing Representative, at (800) 638-2901, ext. 4051, or (301) 871-4051, collect.** If unable to call, send resume with salary requirements to:

Vitro
LABORATORIES

DEPARTMENT CB 3845
14000 GEORGIA AVENUE
SILVER SPRING, MARYLAND 20910

AN EQUAL OPPORTUNITY EMPLOYER M/F/H
U.S. CITIZENSHIP REQUIRED

DALLAS

LIFE INS. MGMT.

Mgr. of plans, controls, Q.A. & training staffs needed by large IBM client, degree, good track record and life ins. industry req'd. Executive position leads to VP level. To \$40K.

2720 Stemmons Freeway 1207F
Dallas, TX 75207 (214) 637-6360

**DATA PROCESSING
CAREERS**

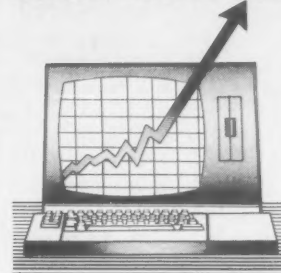
AVAILABLE NOW

Corp. MIS Director	\$50-55K
Sr. Systems Analysts	\$28-37K
Software Specialist	\$28-39K
Tech. Progs. Pascal, Assemb.	To 38K
DB Admin. Health Care	\$35K
Prog./Analysts COBOL	\$26-34K
Group Leader P/A IBM Hdw.	\$30-39K
Programmers COBOL, RPG	\$16-30K
Systs Progs VMS/IMS, MVS/Open	

All fees, relocation and interviewing costs are paid by our client companies. For details on any of our current openings call or submit a resume to:

Ethan Allen Personnel Agency
30 W. State St.
Binghamton, NY 13901
(807) 772-1560

General Electric Professional Services Company



Going Beyond The Boundaries Of Ordinary Growth.

Sure, a lot of DP professional service companies talk about their growth. And their innovations. And their so called "unique opportunities." But the fact is, only General Electric Professional Services Company can truly offer what most professional service companies can't.

FACT #1 — LTI Consulting Services Corporation (LTI), and the Systems Development and Consulting Operation (SDC) of General Electric Information Services Company have recently integrated to form General Electric Professional Services Company. Both LTI and SDC have experienced growth that is double the professional services industry average. That's right, double.

FACT #2 — Our consulting innovations and professional resources have helped us amass over 400 major clients around the world. Clients that depend on our definitive solutions to every imaginable EDP problem.

FACT #3 — We offer Technical Specialists with 2+ years experience in one or more of the environments listed below the opportunity to become absorbed in such a varied selection of applications and environments, that professional enhancement and career growth is the norm. Not the exception • COBOL • COBOL IMS • PL/1 IMS • CICS • UNIX/C • BAL • TSO/SPF • OS MVS.

If you're a data processing professional who's been waiting for the right opportunity to make a strong career move, and you've got the skill and desire to join the elite professional services firm of the 80's, seriously consider General Electric Professional Services Company.

Our salaries and benefits are competitive, our challenges endless. Opportunities exist in various locations throughout the country.

Please call Cheryl M. New, Personnel Manager collect at (201) 457-0200, or send your resume in complete confidence to her attention: General Electric Professional Services Company, 45 Knightsbridge Road, Piscataway, NJ 08854.



**INFORMATION
SERVICES**

General Electric Professional Services Company

Equal Opportunity Employer M/F

MOVE STAY SOUTH NOW!



Our computer can help you get here or stay here. Four WATS lines; 13 years' experience; 270 affiliated offices; 300+ current job orders; 3000+ company clients from Virginia to Texas to Florida! Send resume to:

DATA RESOURCES, USA
Division of Landrum Personnel Resources
P.O. Box 1373C
Pensacola, Florida 32596-1373

CALL TOLL FREE (800) 874-2407
IN FLORIDA (904) 434-2321 COLLECT

COMPUTER HARDWARE DESIGNER

To analyze the needs of laboratories and other customers using computers for research; design computer hardware systems to meet those needs. Designs will especially focus on Aspect 2000 data systems as associated with Buckler CXP 2000 NMR Spectrometer. Salary \$25,000 per year, 40 hour week. Requires Master of Science Degree in either Computer Science, Chemistry or Physics, general knowledge of computer hardware design, fluency in FIRST and ASSEMBLY languages plus one year experience with Buckler CXP 2000 NMR Spectrometer and Aspect 2000 data systems. Resumes to June Carroll, Job Service 566 Washington, St. Louis, MO 63101. Refer to job order number 639486.

Equal Opportunity Employer



CALIF. & UNIX
Openings in a variety of
areas and disciplines.

(714) 891-UNIX

CPU COMPUTER
PROFESSIONALS
UNLIMITED, agency
7441 Garden Grove Blvd.
Ste. G, Garden Grove, CA 92641

MANAGER COURSE DEVELOPMENT MARKETING

DATAPOINT continues to set the pace in sophisticated information processing systems. Whether it is data, words, images or distribution of all three, we are developing the most advanced systems on the market today!

SAN ANTONIO, THE NATION'S 10th LARGEST CITY, CONTINUES TO OFFER A VERY HIGH QUALITY OF RELAXED LIVING, FROM EXCITING CULTURAL EVENTS TO VARIED RECREATIONAL ACTIVITIES. BEST OF ALL, THERE IS NO STATE INCOME TAX! Look into DATAPOINT and SAN ANTONIO and you will find a wealth of opportunity!

This position is responsible for all courseware development in the areas of sales, systems and customer education. Requires successful development experience in learner-directed study packages, CAI and video. Candidates must have a minimum of a bachelors degree and 4 years in a course development activity. Prior management of a development group is preferred.

DATAPOINT offers competitive salaries and benefits. For immediate consideration, please send your resume with salary history to Mr. Chuck Melvin, Dept. CW, Datapoint Corporation 9725 Datapoint Dr., MS G05, San Antonio, TX 78284.

We are an equal opportunity employer M/F/H.
Principals Only

DATAPOINT

position announcements	position announcements	position announcements	position announcements	position announcements	
<p>SCIENTIFIC PROGRAMMERS WANTED</p> <p>in Tucson, Arizona and Sunspot, New Mexico (in the mountains near Alamogordo, New Mexico).</p> <p>The National Solar Observatory has openings for</p> <p>REAL-TIME/APPLICATIONS MINICOMPUTER PROGRAMMERS</p> <p>to work on a variety of challenging problems associated with instrument control and data acquisition, processing and reduction. Hardware includes:</p> <ul style="list-style-type: none"> -Tucson- VAX Dec Varian Motorola 68000 -Sunspot- PE3220,3240 VAX Xerox Sigma 3 FPS Array Processor Motorola 68000 (Multi-bus) AMD 29500 Bit-Slice 6502 Microprocessor <p>You should have</p> <ul style="list-style-type: none"> • B.S. or advanced degree • Ability to work with minimum supervision • Real-time or scientific applications programming experience <p>Send your resume, including salary history, and location preference to:</p> <p>Frank A. Hegwer National Solar Observatory Sunspot, NM 88349 An Equal Opportunity Employer</p>	<p>WANTED:</p> <p>SYSTEMS REPRESENTATIVE</p> <p>to install the software systems of The Renaissance Group, Ltd. on medium to large mainframes at a variety of customer sites across the country. Requirements: (1) College graduate - preference in mathematics or science, (2) COBOL experience - at least 3 years, (3) Experience on a variety of mainframes desirable. Send resume and salary history to:</p> <p>The Renaissance Group, Ltd. P.O. Box 4430 Portsmouth, NH 03801</p>	<p>SOFTWARE ENGINEERS SUNBELT TO 70K</p> <p>UNIX, C, PASCAL, DEC/PDP-11, REALTIME, INTEL 86/88, VAX, RSX-11, SCADA.</p> <p>To explore sunbelt opportunities in software design in the above environment call or send resume to:</p> <p>fox-morris personnel consultants</p> <p>808 GILLIAN - 1350 Jernigan Bldg. Charlotte, NC 28281 - (704) 375-0600 KYLE PURDY - Agency Center 2 - Suite 601 5501 LBJ Freeway - Dallas TX 75240 (214) 934-2350 MIKE HUNTER - 3101 Poplarwood Court Raleigh, NC 27625 - (919) 872-2940</p>	<p>Could you SELL VM</p> <p>system software products? New company with quality products for VM/SP needs a top inside salesperson. Outstanding opportunity to invent your own job in a rapidly growing small firm. Sales support tools in place. Knowledge of VM and selling ability required; degree preferred. All else negotiable.</p> <p>VM Systems Group</p> <p>3123 N. Military Rd., Arlington, VA 22207</p>	<p>DATA PROCESSING PROGRAMMER</p> <p>A Northern Massachusetts Company is seeking a Data Processing Programmer. Two to three years Interactive System Design, documentation and implementation skills on an IBM System/34 with RPG II Programming are required. The successful candidate for this position will demonstrate a potential to move to Department Supervisor. Characteristics sought are: a self-starter, good planner and organizer and a team player. No relocation fee.</p> <p>Please send history and resume to:</p> <p>W.K. Heckman Associates, Inc. Post Office Box 73 Canton, MA 02021</p>	
<p>EXECUTIVE DIRECTOR FLORIDA INFORMATION RESOURCE COMMISSION</p> <p>The Governor of the State of Florida is seeking an Executive Director for the Information Resource Commission. This individual will be responsible for the coordination and implementation of policies and procedures relating to the planning, acquisition and use of the information technology resources by all state agencies. Applicants should have experience in a high level management position, knowledge of the field and excellent communication skills. Salary \$45,000 plus. Excellent benefits. Resume should be submitted no later than July 22, 1983 to Personnel Director, Office of the Governor, The Capitol, Tallahassee, FL 32301 (904) 488-4505.</p> <p>Equal Opportunity Employer</p>	<p>PROFESSIONAL ENERGY MANAGEMENT SYSTEM COMPUTER ANALYST</p> <p>Responsibilities include designing and creating microcomputer operating system for the energy conservation division of a university physical plant. Bachelor's in computer science and two years' experience in energy management control system software to include design and development using Digital Equipment Corporation MACRO Assembler language, Digital Equipment LSI11 machine language, Oregon Microcomputer PASCAL II, Digital Equipment Corporation RT11 foreground/background operating system and Digital Equipment RSX11M multi-user operating system experience required. Salary \$20,000 annual. Submit a letter of application and resume to:</p> <p>Nebraska Job Service P.O. Box 95206 Lincoln, Nebraska 68508</p> <p>An affirmative action/equal opportunity employer</p>	<p>COMPUTER ENGINEER</p> <p>Job Order #1030876</p> <p>Responsible for the effective operation of the Infocan System. Design the expansion of the capability of the Infocan System. Write procedures for control of remote equipment via remote multiplexing units and terminal units to be interfaced with the Infocan. Must be familiar with EPROM programmer and control systems. Must have Infocan Systems Certificate B.S. Computer Engineering. 40 hours per week, \$23,177 per year.</p> <p>Contact:</p> <p>Mississippi Department of Labor 207 East Canal Street P.O. Box 430 Picaune, MS 39466</p>	<p>Contract Assignments PROGRAMMER ANALYSTS</p> <p>Experience in IBM systems 3081, 31-COBOL, IDMS and ADDS-0 equip.</p> <p>8080 Micro-processor, PL/M, CICS, COBOL, IMS and Communications.</p> <p>AIDE Management Resource, Inc. P.O. Box 8810 Richmond, VA 23225 800-446-9652</p>	<p>COMPUTER ENGINEER</p> <p>Industry leader in Electronic Home Information Systems seeks a Computer Engineer with MSCE or equivalent college level studies (6 years) major emphasis computer/electrical engineering, to help create and perfect videotex frame and images. Also 2 years experience in computer engineering required. \$28,000 salary, Monday thru Friday 8:30 to 5:30. Position involves TV camera/video scans, and conversion of digitized images by use of TV cameras or CCD devices. Conversion of digitized images to PL/P code with image processing techniques to clean, filter, and enhance digitized data. Report to Florida State Employment Service, 1350 Northwest 12th Ave., Room 280, Miami, FL 33142-1400 Job order #3001020.</p>	<p>D.P. ANALYSTS/PROGRAMMERS</p> <p>Cincinnati and national based companies require DP professionals from \$20K-\$42K. We will work with confidence within your restrictions on salary and responsibilities. Call or write Fred Turton</p> <p>The Angus Group Inc. 2337 Victory Parkway Cincinnati, Ohio 45206 • 513 961-5575 Personnel Services to Business</p>

BUY•SELL•SWAP

WANG•DEC DISK DRIVES

Authorized National CDC OEM Offers New Disk Drives and Controllers for WANG/DEC Systems.

WANG #	DEC #	CDC #	ERST-CDC Price
2280-3 (80.4 MB)	RKO 7 (84 MB)	9448	\$ 9,400
2280V-3 (90 MB)			
6580-3 (80.4 MB)			
Special Disk Cartridge offer—\$165 each, with purchase			
2265V-1 (75 MB)	RMO 3 (67.4 MB)	9762	\$ 8,500
Special Disk Pack offer—\$290 each, with purchase			
2265V-2 (288 MB)	RMO 5 (256.2 MB)	9766	\$ 12,900
6565			
Special Disk Pack offer—\$655 each, with purchase			

Prices include installation, 90-day full warranty parts and labor, stand, cables, terminator (Controllers additional.)

**TELEPHONE: 1-800-FOR-ERST
IN NEW YORK: 212-431-1100**

ERST
INTERNATIONAL CORPORATION

225 LAFAYETTE STREET, NEW YORK, N.Y. 10012

SYSTEMS • PERIPHERALS • PARTS

WANG DEC

Phil Thomas
305-392-2006

Bryan Eustace
305-392-2005

Jennifer Eustace

305-392-2007

TELEX 568-670

BUY - SELL - TRADE - LEASE

THOMAS BUSINESS SYSTEMS, INC.

Hi! Let's talk! We want to tell you about our flexible plans for buying, selling, leasing, renting, purchase/leaseback of IBM System 34 & 38 and 3741/3742.

We have a large inventory of CPU's, CRT's, and printers. We'll even talk about System/36!



Call John Spight or Ken Warren



Pearl Computer Division

P.O. Box 24026 • 4717 Centennial Blvd.
Nashville, TN 37202 (615) 383-8703

NEW USED

UNBEATABLE PRICES

T.I. Specialists*

ADDS



DEC

DIABLO

HAZELTINE

QUME

TELEVIDEO

TEXAS INSTRUMENTS

TO 50% DISCOUNT

THE COMPUTER BANK

315 Rte. 110, Hunt. Sta., New York 11746

(516) 549-5500

* Printers, Systems, Terminals, VDT's

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap



**AMERICA'S LEADING SPECIALIST
SERVING THE USED MARKET**

REGIONAL MARKETING OFFICES

Atlanta, GA (404) 256-7942
Boston, MA (617) 367-5755
California (408) 773-1614
(415) 958-3183 (714) 752-8443
Chicago (312) 693-2790
Dallas, TX (214) 385-0806
Houston, TX (713) 780-7459
New Jersey (609) 645-7282
New York City (212) 349-0718
Tennessee (615) 449-6633
Washington, D.C. (703) 442-4941
Geneva, Switzerland Telex: 289950 WTCG
Montreal, Quebec (514) 871-1121
Toronto, Ontario (416) 673-3081
Paris, France Telex: 613910 CMI FR
Windsor, Ontario (519) 258-8910

CMI FINANCIAL SERVICES, INC.

755 W. Big Beaver, Troy, Mich. 48084
(313) 362-1000
New CMI 4300 Series Hotline Number: 800-331-4300



Since 1969
CORPORATION

755 W. Big Beaver, 19th Floor, Troy, Michigan, 48084
TWX/TELEX: 810 232-1667 CMI CORP TRMI

(313) 362-1000

A Torchmark Company
Member CDLA

3033-U16

Fully Featured
Available Now
Lease or Sale

3081/3083

Lease Financing
Available

For Your System or Ours
2, 3, 4 or 5 Year Terms

Wanted
4341-M2

4341-L01

Call Now

Series 1
New 4956B's, 4967 Disk
Used 4955F's, 4955E's
Immediate Delivery
Buy-Sale-Trade
Leases Available

3033-N8

Fully Featured
Available Now
Lease or Sale

AMDAHL

V8 and V611

Available for
Sale or Lease

Series 1 I/O
New or Used
IBM/CCC/Printronic/
Datum/Data South/NEC
Printers - ASC11/3102
180 CPS/1130 LPM
Tape Cassettes - Back-up Unit
Datum 20MB-45MB
Disks - Fixed/Removable
3.3MB-240MB
Buy-Sale-Trade Leases Available

3350 3880 3830
3340 3370 3330
3375 3380

Buy/Sell/Lease

Pat Callahan
Tim Ryan

3038-1

M.P. Box
Available Now

USED
**3081-D's
or K's**

For Sale or Lease

SYSTEM 38

Convert your IBM
S/38 Lease to a
CMI Leaseback
12-24-36 Month Terms
New/Used CPU's Avail.
Kevin Schaefer

2914

3203 3505/3525
3800 3211/3811

Mary Drangin
3803/3420
Immediate Delivery

3033

S to N N to U
Upgrades

3042

Attached Processor
Available Now
Short Term Lease

NEW 5224 PRINTERS

Greater Discounts Than IBM
Leases Available
5224-1 (140 LPM) \$165/mo.
5224-2 (240 LPM) \$188/mo.
Call For Short Term Rates
Immediate Delivery
Kevin Schaefer

Communications

IBM 3705
IBM 3704

Kathleen Austin

System

**38/36
34**

- Significant Savings • Trade-In Allowance • Guaranteed Full IBM Support • You pay only after installation and IBM accepts the equipment under maintenance • Fortune 500 references

Can you believe lease terms better than IBM?

- New Tax Lease
- Purchase/Lease Back
- Check IBM's New Plan R & B... then call Datacomp



**The Datacomp
Leasing & Service
Group**

Toll free 1-800-323-3889
New Jersey 801/467-8686
Chicago 312/448-4300

The Market Leader in current used IBM
BUY • SELL • LEASE

SERIES 1
and
peripherals

XERXES

COMPUTER SALES

1614 Harmon Place, Suite 210, • Minneapolis, MN 55403

800-328-3884 / 612-339-3042

**We have the IBM
computer business
down to a system.**

BUY • LEASE • SELL

Systems

System 38 • System 34 • System 32
Series 1 • 5110/5120 • Others

Peripherals

Including: CRTs • Printers • Disk & Tape Drives
Modems • Others

CARLYN

COMPUTER SYSTEMS, INC.

Wash, DC: 5105-Q Backlick Road/Annandale, VA 22003
Denver: P.O. Box 3073 / Englewood, Colorado 80155 / (703) 642-1950

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

**If we
can't get it,
it can't be got!**

The Total Computer Company...

- Flexible lease terms.
- Purchase lease-backs.
- Equipment for sale.
- Maintenance service contracts.
- Substantial inventory available.
- Refurbishing & reconfiguration by our own staff.
- Data center relocations & installations.
- Custom software design.

Available Immediately...

IBM Mainframes

4341	3033
4331	3031

IBM Peripherals

3350	3203	3278
3375	3211	3274
3380	3811	3276
3880	3505	3287
3803	3525	3704
3420	3178	3705

Hartford Computer Group

A Subsidiary of Hartford Financial Corporation
515 East Golf Road, Arlington Heights, IL 60005

800-323-6355
or 312-364-0505

BROOKVALE
RENT • SELL • UPGRADE • BUY

DEC

PDP 8, 11/03, 11/04, 11/23, 11/24, 11/34,
11/44, 11/45, 11/60, 11/70, VAX/750, VAX/780

SYSTEMS • OPTIONS • SUPPLIES

11/70	513Kb MOS, LA36 (used)	\$48,500
11/23	PLUS, MOS memory, Dual RLOZ's (new)	Call
VAX 730	System with license (new)	\$29,850

Customized Configurations—Call With Your Request.

In Stock	Specials	In Stock
BA11-SE (new)	\$2,495	109542 (new)
DB11-A (unused)	\$ 495	LA34-AA (new)
DL11-E (used)	\$ 375	MS730-CA (new)
DM132-AA (new)	\$3,495	MS730-CA (new)
DU11-DA (used)	\$ 795	RL02-AK (new)
DUP11-DA (used)	\$ 950	RLV22-AK (used)
DZ11-E (new)	\$3,595	RM05-AA (used)
FP750 (new)	\$5,950	RM05-AA (used)

BROOKVALE ASSOCIATES
40 ORVILLE DRIVE • BOHEMIA, NEW YORK 11716

(800) 645-1167 • NEW YORK (516) 567-7777

ALL IBM COMPUTERS ARE CREATED EQUAL
BUT, ALL IBM BROKERS ARE NOT!! CALL US

**INTERSTATE
COMPUTER
EXCHANGE**

IBM
BUY • SELL • 72 HOUR UPGRADES

S/34 IMMEDIATE DELIVERY
ALL PERIPHERALS AND FEATURES
30% TO 40% OFF LIST

S/32 • S/38 • SERIES I • ALL IBM EQUIP.
NEW S/23 — LARGE DISCOUNT!!

GUARANTEED !!
IBM MAINTENANCE • DELIVERY DATES

WANTED —

- ALL S/34 CONFIGURATIONS
- ALL S/34 & S/38 PERIPHERALS
- ALL LEASED & OWNED MACHINES.

BUYING OR SELLING EQUIPMENT

WE WILL LIST YOUR EQUIPMENT ON A COMPUTERIZED READOUT. IN MINUTES ALMOST EVERY BROKER AND DEALER IN THE COUNTRY WILL BE INFORMED OF YOUR PENDING SALE OR PURCHASE OF EQUIPMENT.

7578 TRADE STREET CALL PAUL CAYTON
SAN DIEGO, CA 92121 COLLECT (619) 578-5410

**C.D. SMITH &
ASSOCIATES, INC.**
DEC computer systems & components
12805 East Freeway, Suite 318
Houston, Texas 77015
(713) 451-3112
TELEX 76-2547

DEC

WE ARE BUYING: VAX 11/750,
11/780, H7112-A, H9602-DF,
RPO6

WE ARE SELLING:

11/780-CP
MS780-DC
MS780-CC
FP780-AA
DW780-AA
H7100-A
H9602-HA
RH780-AA
MS750-CA
FP750-AA
RH750-AA

If you want on our Mailing List,
call Valerie (713) 451-3112.

FOR SALE

IBM SYSTEM/38 Mod 7C1
Comm (2 Lines, SDLC)

Other Peripherals:

3370/A11 (4)5256/003
3411/033 (2)3262/IB01
5225/004 (6)3864/001

Available September 1983

Call or Write

**SOUTHERN DATA
SYSTEMS, INC.**

6616 Highway 100
Nashville, Tennessee 37205

800-251-2614
615-352-6565 (In Tennessee)

TEXAS INSTRUMENTS (NEW)

TI 743	\$768
TI 745	\$1036
TI 763	\$2129
TI 765	\$2366
TI 781	\$1102
TI 785	\$1576
TI 810	\$1339
TI 820	\$1576

ADDS (NEW)

Viewpoint A2	\$550
Viewpoint A3	\$510
Viewpoint 50	\$730
Viewpoint 50	\$665

DIABLO (NEW)

630 RO	\$1785
630 KSR	\$2480

NEC SPINWRITER (NEW)

NEC 3550	\$1945
NEC 7710	\$2208
NEC 7715	\$2231
NEC 7720	\$2573
NEC 7730	\$2208

QUANTITY DISCOUNTS AVAILABLE
We Also Discount Computers - NEC
GAMTEL - Texas Instruments
THE SKIERS • 516-242-8996
PO Box 724 • 145 West Whitman Road
• Melville, New York 11747

**LEASING
A
LARGE
COMPUTER?**

Look
for the
best deal
in the
classified
pages of
COMPUTERWORLD
Call
800-343-6474
(or 617-879-0700)
for more info.

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

BUY
SELL • LEASE**DISK**3340 • 3344
3350 • 3380**TAPE**3411 • 3410
3420Call Bob Ford
or Nelson Johnson**S/38
S/34
S/36
S/3
SERIES/1**Call Gayle Drotar
Roger Odom
Ken Winzen**Personal Computer****370 Systems**4341 • 4331
3031 • 3032
3033 • 3081Call Jack Harvey
or John Bottom**NEED TO REDUCE
EXPENSES?****ECONOCOM'S
PURCHASE-LEASEBACK
PROGRAM CAN PRODUCE
IMMEDIATE SAVINGS ON
YOUR PRESENT
EQUIPMENT—CALL FOR
DETAILS.****ECONOCOM**845 Crossover Lane
P. O. Box 240297
Memphis, Tennessee 38124

901-767-9130

Member
Computer Dealers
& Leasing Association**Upgrading?
MEMORY****IBM & OEM**

158, 168, 3031, 3033

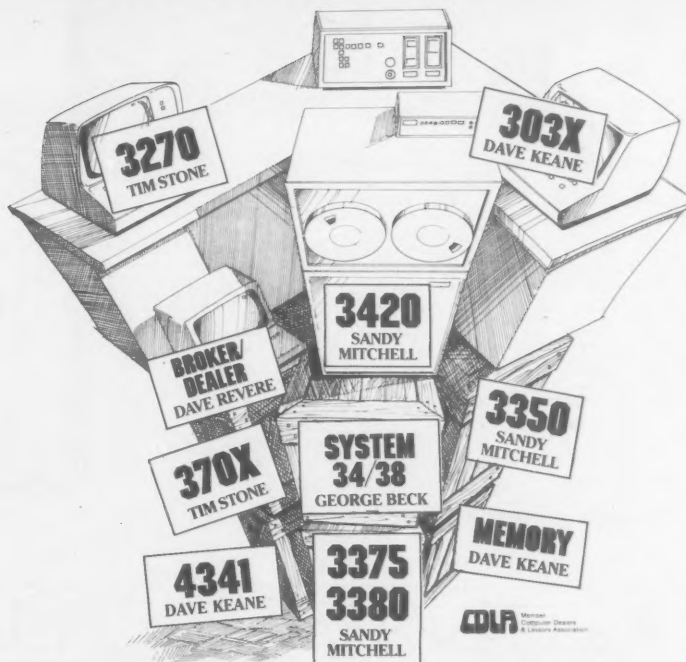
Call:

Rohn or Bob Miller
(612) 884-3366

Centron-DPL Company

**PRIME
COMPUTER USERS**New 80 and 300 megabyte drives
Available for immediate delivery.
300/1440 LPM Printers
also available.
Nationwide CDC maintenance
and financing.Call Barry Dacks
Timesharing Services Inc.
(904)396-7068

THE HARDWAREHOUSE IS HARD TO BEAT FOR PRICE AND AVAILABILITY.

**CALL US TODAY AT (602) 248-6848, PHOENIX, ARIZONA
OR CALL OUR LOCAL OFFICE IN YOUR AREA****Boston: Eastern Regional Headquarters (617) 272-8110**
Washington, D.C. (703) 525-5233
New York (212) 832-2622
Philadelphia (215) 293-0546**Chicago: Central Regional Headquarters (312) 789-9100**
Pittsburgh (412) 922-8920
Detroit (313) 995-8717**San Francisco: Western Regional Headquarters (415) 283-8980**
Los Angeles (213) 670-7994
Denver (303) 534-7436
San Diego (714) 231-2361
Seattle (206) 447-1682
Phoenix (602) 248-5978
Portland (503) 228-7033
Salt Lake City (801) 298-4281**Austin: Southern Regional Headquarters (512) 451-0121**
Atlanta (404) 768-6535
Dallas (214) 233-1818
Houston (713) 629-4440**Canada: Toronto (416) 366-1513**
Montreal (514) 281-1925**GREYHOUND COMPUTER CORPORATION**SUBSIDIARY OF THE GREYHOUND CORPORATION
800-528-6113**DATA GENERAL**

We Buy, Sell And Service

New And Surplus Systems and Peripherals

Call Or Write

Hanson Data Systems

(outside Mass. toll free)

(within Mass.)

1-800-225-9216

(617) 481-3901

P. O. Box 27, Southboro, MA 01772

**FORSYTHE
McARTHUR ASSOCIATES, INC.**DEALER / LESSOR OF IBM
Computers and PeripheralsHome Office
Chicago
209 North Michigan Avenue
Chicago, Illinois 60611
312 943-3770Branch Offices
Atlanta 404 953-9457
Dallas 214 934-9516
Milwaukee 414 785-9544

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

GREYHOUND MEANS COMPUTER LEASING IN ANY LANGUAGE.

Vente et location d'ordinateurs

Computer leasing und Verkauf



Today, Greyhound Computer Overseas Corporation, one of the largest and most experienced computer leasing firms in the business, can meet your computer equipment requirements almost anywhere in the world.

We have a large portfolio of IBM computer equipment. And we have the financial strength to be able to lease, buy, sell, trade, purchase/

leaseback or structure a leveraged lease for you.

Our Agents, Representatives and Affiliates throughout the free world may be contacted through our principal offices or our Dallas headquarters.

For your non-IBM equipment needs, domestic or worldwide, contact Don Haworth or John Hallmark in Dallas.

DALLAS (Hq.)
Greyhound Computer Overseas Corporation
4101 McEwen Road
Suite 374
Dallas, Texas 75234
(214) 233-1818
Telex: 163177 GCOG UT
(via TKT)
Telex: 794500
GCOG FABR
TWX 9108605500
GCOG FABR

ENGLAND
Greyhound Computer (U.K.) Ltd.
7th Floor
Regal House
London Road
Twickenham
Middlesex TW1 3QN, England
44-1-891-4986, 7, 8
Tlx: 85291329
GHCMP G

FRANCE
Greyhound Computer France, S.A.
89, Rue de Tocqueville
75017 Paris, France
33-1-267-50-46
Tlx: 842642144
GREYHFR 642144F

GERMANY
Greyhound Computer Deutschland, G.m.b.H.
Rottenbuecherstrasse 32
8032 Graefelfing, West Germany
49-89-85-10-59
Tlx: 841524168
524168 GREYH D

GERMANY
Greyhound Computer Deutschland, G.m.b.H.
Klosterstrasse 4
6240 Koenigsstein/Taunus, West Germany
49-61-74-30-94, 5
Tlx: 84410652
410652 GREYH D

SWITZERLAND
Greyhound Computer, S.A.
36, Rue de la Gare
1240 Nyon, Switzerland
41-22-61-27-54
Tlx: 84527786
27786 GREYD CH



GREYHOUND COMPUTER OVERSEAS CORPORATION

(214) 233-1818

A subsidiary of Greyhound Computer Corporation

SERIES I SPECIAL

Control Data 64, 126, 240MB Removable Drives Printers & Displays

IBM 4955F, 3101, 4978, 4963-64MB, 4975, Features

NEW OR USED Immediate Delivery

ALL UPGRADES

TERMINALS 3277 3278 5256 3287 5251

TAPE 3411 3420

DISK 3340 3350 3370 3375 3380

PRINTERS IBM - All Models NEC - Letter Quality for 594, 578 DATAPRODUCTS - 340 CPS to 1500 LPM for all IBM Systems

LEASING SHORT OR LONG TERM NEW OR USED

4300 New or Used

SYSTEM 38 New or Used

SERIES I IBM & CDC CPU'S ALL MODELS PRINTERS FEATURES New or Used

SYSTEM 34

BUY LEASE IBM Maintenance Guaranteed, Equipment Configured to Your Requirements

IF IBM MAKES IT, WE CAN SAVE YOU MONEY - whether you buy, lease or rent from us. We also need to buy your owned or rental credit equipment. Call us for a quote.

Marshall Lewis & Assoc., Inc. M.L.A. (714) 641-0366

Call Us First or Call Us Last
Buy • Sell • Lease

Processor	Peripherals	Banking Equipment
S/23	3741	1255
S/32	3742	1419
S/34	029/129	3600
S/38	5211	
5110	5251	
5114	5225	
5120	5256	
DATAMASTER	3262	

ID Southern Data Systems 800-251-2614
Dallas, Texas 75201 (615) 352-6565

**We Buy & Sell
DEC
Systems
Components**

**call: 713
445-0082**

Digital Computer Resale

600 Kerck St C22
Houston, TX 77060

**WANTED TO BUY
DEC Equipment
Vax and PDP-11**

Systems-Components-Peripherals
New or Used
(617) 777-4666



*** DEC ***

BUY—SELL—LEASE—TRADE—CONSIGN

— SYSTEMS —

11/44, Dual RM02, TS11, DZ11E
11/34A, Dual RL01, LA36, RSX11M
11/60, Dual RK06, FP11EA, DZ11
11/23, Dual RL01, RX02, DLV11J
11/730, RA80, RL02, VMS
11/34A, Dual RK06, TJU16, RSX11M
11/750, Configure to your specs.

— CPU'S — DISK-TAPE-MEMORY —

Call for Quotation

— OPTIONS —

FP11 (All Types), FP750, FP780
DMC (All Types), DMR11-AC, KMC11B
DT03, PCL11-A, DH11, DZ11
PC11, DJ11, DQ11, DV11BC
DUP11, DR11, KK11, RH11, LP05
TM03, KW11P, KW11W, KG11
RH780, MM11YP, MS11KE
TMB11, DA11BD, RH70, KY11LB

SPARE FOR ANY DEC UNIT
CALL FOR QUOTE

NATIONAL COMPUTER

EXCHANGE

800-854-7224

6980 Aragon Circle, Suite 5 • Buena Park, CA 90620

(In Calif.) 714-522-1870

TXW-910-596-1499

COMPUCOM

BUY-SELL-TRADE

RP07-AA \$26,250
RP07-BA \$28,750
RP06-AA \$13,250
RP06-BA \$15,750

COMPUCOM INC.

3404 OAKCLIFF RD., C-4 ATLANTA, GEORGIA 30340
(404) 452-1090 / TWX 810-757-0202

IBM

SERIES/1	AND	PERIPHERALS	
4952	4955	4973	4966
4962	4963	4974	4978
SYSTEMS/34	ALL	MODELS	
5211	3262	5251	5256
5110	5120	5114	5103
3340	3344	3410	3411
3776	3777	3741	3742

SYSTEM/32
029 129

Want to Buy
S/34 s & Series 1's
All Models



Genie Nicholl
Headquarters
214-934-9152
14229 Proton
Dallas, TX 75234

E. R. McDonald
West Coast Office
213-704-9725
4526 Saddle
Woodland Hills, CA 91364

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

SYSTEMS

4341 4331

38 34

32 3

BUY • SELL • LEASE

COMPUTER
BROKERS, INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE



TOLL-FREE

800-238-6405

901-372-2622

PERIPHERALS

3203 3370

3340 3411

3350 3420



214/385-0354

BUY-SELL
LEASE

- All IBM Systems
- Peripherals
- Tapes
- Disks

SERIES/1

- Systems
- Features
- Peripherals
- New systems available at substantial discounts

IBM P.C.

- Lease program for IBM personal computers

PIONEER COMPUTER
MARKETING

4835 LBJ Fwy, Suite 680
Dallas, Texas 75234
214/385-0354

DATA GENERAL
SPECIALISTS

FOR
Surplus New & Used
Equipment & Systems
with full depot repair facilities.

CALL US
WE TAKE THE TIME.
- WE CARE -

JM Associates
601 W. Chapel Avenue
Cherry Hill, NJ 08002
609-663-1115



Your First Choice ☒
In The Second Market

IBM PROCESSORS

- ☐ 308X 36-60 Month Leases (ITC Lessor or Lessee)
- ☐ 3033 Available for lease or sale now
- ☐ 3032 Available for short term lease
- ☐ 3031 Available for lease or sale now (along with A/P's)
- ☐ 4341 We're Buyers, Sellers and Lessors of Group I's and II's
- ☐ 4331 Group II's available for lease or sale
- ☐ Memory/Channels available for 303X, 4300 and all 370's

IBM PERIPHERALS

- ☐ 3880/3830 Immediate Availability
- ☐ 3380/3375 Immediate Availability
- ☐ 3350/3370 Immediate Availability
- ☐ 3803/3420 Immediate Availability (All models)
- ☐ 3800 30-day Availability
- ☐ 3704/3705
- ☐ 3811/3211 Immediate Availability
- ☐ 327X We're Buyers, Sellers and Lessors

We Can Put It Together

Eastern Regional Headquarters
(Connecticut) 203-685-1211
New Jersey 201-588-9666
Washington, D.C. 301-441-1000
Philadelphia, PA 215-545-8035
Boston, MA 617-542-4005

Midwestern Regional Headquarters
(Chicago) 312-698-3000
Michigan 313-644-1500

Western Regional Headquarters
(San Francisco) 415-944-1111

South Central Regional Headquarters
(Dallas) 214-641-3255
Atlanta 404-256-5956
Florida 305-428-3177

Canadian Regional Headquarters
(Toronto) 416-968-7135

International Headquarters
(Chicago) 312-698-3000
Latin America 305-666-6258
Paris 01-524-5270
Switzerland 41 (21) 71 09 35
West Germany (2434) 5048

Corporate Headquarters
6400 Sinaier Court
Rosemont, IL 60018 TWX 910-253-1293



A MEMBER OF CDLA AND LISTED ON THE NEW YORK STOCK EXCHANGE

IBM UNIT RECORD EQUIPMENT & DISK DRIVES
DISK PACKS, DATA MODULES, MAG. TAPE, DISKETTES

SALE OR LEASE

machines
026-029-082-083-084
085-087-088-129-514
519-548-557-3330-3340



disk packs
2316-3336(1)-3336(11)-3348(70)
5 MEG. TO 300 MEG. PACKS-NEW & USED
Highest Prices Paid for Used Packs & Machines

THOMAS COMPUTER CORPORATION

5633 W. Howard St. Chicago, IL 60648
800-621-3906 312-647-0880
Authorized Distributor-Memorex, CDC, 3M, BASF, Verbatim

System/34
Printer &
Displays
Sale/Lease

Controllers
3880 3830
3803
Immediate Delivery

Control Units
3274 3272
3276 3271
Immediate Delivery

WANTED
4341 Grp 1 or 2
For Outright Purchase
Or Purchase-Leaseback
Short or Long Term

DASD
3380 3375 3370
3350 3344 3340
3330 3310
Immediate Delivery

We Buy, Sell & Lease
IBM Processors and
Peripheral Equipment

Tape Drives
3420
3410 8809
Immediate Delivery

Printers
3287 3289
3203 3211
3262 1403
Immediate Delivery

Display Stations
3278 3277
Immediate Delivery

Contact Bernie Gest 215-782-1010
Computer Marketing Inc.
7704 Seminole Ave., Philadelphia PA 19126

CDLA

buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p>DATA STAR DEC SYSTEMS VAX 11/750, 11/44, 11/34, 11/24 PERSONAL COMPUTERS DISCS FUJITSU, KENNEDY, CDC, W/EMULEX TAPES KENNEDY, CIPHER, W/EMULEX OPTIONS COMMUNICATIONS, TERMINALS, PRINTERS ALL DEC SOFTWARE COMPLETE INSTALLATION • MAINTENANCE BUY-SELL-TRADE-IN ALL NEW EQUIPMENT</p> </div> <div style="width: 35%; text-align: center;"> <p>DEC</p> <p>INVENTORY CLEARANCE THIS WEEK'S SPECIAL VAX 11/780 \$134,995</p> <p>TWE16 \$6995 PRO350, 5 mb \$6995 DZ11-F \$2995 VAX 11/750 \$45,000 DD11-DK \$725 11/750 414 mb \$18,995</p> <p>PDP11 45 ips \$6495 PDP11 75 ips \$7595 PDP11 125 ips \$8495 PDP11 180 mb \$7495 PDP11 335 mb \$13,995 PDP11 474 mb \$15,745</p> <p>ALL DEC EQUIPMENT ELIGIBLE * INDICATES NEW EQUIPMENT DATA STAR SPECIALIZES IN VAX 11/750 AND PDP 11/44 SYSTEMS CONFIGURED W/CDC, FUJITSU & KENNEDY DISKS, KENNEDY & CIPHER TAPES. Call us NOW!</p> </div> <div style="width: 30%;"> <p>DEC</p> <p>BURROUGHS 6810 BURROUGHS 2930 BURROUGHS 1955 BURROUGHS 4800</p> <p>2480 W. Alameda Ave. Denver, Colorado 80223 (303) 922-8331 Telex: 910-931-0483</p> </div> </div>														
<p>VAX 714-859-7880 23461 RIDGE ROUTE SUITE #H, LAGUNA HILLS, CA 92653</p>														

BUY-SELL-LEASE

SERIES/1

S/38

4300

ALL RELATED PERIPHERALS

S/34

SEE OUR NEW PRICES

S/36

GREAT NEW LEASE RATES

DATA MASTERS

DISPLAYWRITERS

Call toll-free **800-328-5718**
(in Minnesota, 612-544-8660)

COMPUTER OPTIONS, INC.
"the best option"
1650 South Highway 100
Minneapolis, MN 55416

IBM CPU's

3081 3083

3033

4331 4341

sys 38

Call Dataserv Toll-Free when buying,
selling or leasing CPU's or Peripherals
Our numbers speak louder than words

dataserv

509 SECOND AVE. SO. HOPKINS, MN 55343 INTERNATIONAL HEADQUARTERS
TOLL-FREE 800/328-6729 IN MINNESOTA CALL COLLECT 612 933-2575

CDC

3350

DOUBLE DENSITY
33502-A2's, B2's, Control
Units, Dual Access and Fixed
Head Features
CALL RUSS SCHNEIDER
(408) 241-3677
Marketex Computer Corporation

PERIPHERAL

Phoenix CMD 9448-96
115V or 230V
including
"A" and "B"
Cables plus slides
\$5,800.00
(516) 364-2892

FOR SALE OR LEASE

SYSTEM/36

July delivery!

METROPLEX COMPUTER COMPANY, INC.
320 Decker Drive • Suite 180
Irving, TX 75062
(214) 258-0541
TWX: 910-860-9285

All Models, Systems, Peripherals
Available Now!

Series/1

Buy • Sell • Lease
(408) 425-7333
SOURCE
DATA PRODUCTS, INC.
1114 Water St., Santa Cruz, CA 95060

We'll
keep
you
up to
date
week,
after
week,
after
week,
after
week.

buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap
-----	------	------	-----	------	------	-----	------	------	-----	------	------	-----	------	------



encore
(213) 393-8268

IBM SYSTEM/34

S/3 • S/32 • S/38

5291 • 5251

3741 • 3742

BUY • SELL • LEASE
REFURBISHED • RECONFIGURED
SHORT-TERM LEASES
PURCHASE/LEASEBACK



210 SPACE PARK NORTH
P.O. BOX 248
GOODLETTSVILLE (NASHVILLE)
TENNESSEE 37072

800-422-1004

IN TENNESSEE CALL: (615) 859-3872

HOW TO SAVE \$30,000 PER MONTH ON A 3083 LEASE.

Lease the same 3083 that IBM leases for over \$92,000 per month from Randolph—for less than \$62,000 per month. That adds up to savings of \$1,440,000 over a four-year lease period. If you're renting an older machine, Randolph may save you even more—and you'll get about four times the throughput in the bargain.

WHEN IS THE BEST TIME TO TALK TO RANDOLPH ABOUT LEASING A 3083?

Now—because Randolph has 3083's available for 4th quarter delivery. But it's never too late, even if you already have a machine installed. Whatever your situation, we can tailor a lease that will fit your exact needs and let you start saving money right away.

TALK TO RANDOLPH NOW.

We can solve problems like these, and more...

Stuck with a lease on your old machine?

We'll sublease it, and provide a new lease on a 3083.

Own a 3083 but need cash?

Sell your machine to Randolph, and we'll lease it back to you.

Machine installed on a rental basis?

We'll show you how to end the lease and install a new 3083. Any termination charges can be folded into your new Randolph 3083 lease.

LEASING COMPUTERS IS OUR ONLY BUSINESS.

At Randolph, our people have an average of 18 years in the DP industry... from 360's to 3081's. They know all about alternative financing to be sure, but they also know their way around a DP department and the hardware in it.

WE LEASE MORE THAN 3083's.

Whatever your needs, now is the time to talk to Randolph. We provide leases for IBM 303X, 4300 and 3081 systems and peripherals—disks, tapes—as well as 3083's.

UNIQUE FINANCIAL STABILITY.

We're an important part of one of the nation's oldest and leading financial institutions... The First National Bank of Boston. 18 years in computer leasing gives added assurance that Randolph will continue as the leader in the computer leasing industry... continue to live up to the terms and conditions of our agreements... provide upgrades... fulfill all of our commitments.

LET RANDOLPH HELP YOU SAVE \$30,000 PER MONTH.

We can solve a lot of problems for you, and save you money, too. Talk to Randolph now... call Joseph B. Kelly, Jr., Senior Vice President, 800-243-5307.

537 Steamboat Road
Greenwich, Connecticut 06830
203 661-4200 • 800 243-5307

Randolph



THE FIRST NATIONAL BANK OF BOSTON
BANK OF BOSTON

A MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION RANDOLPH COMPUTER CORPORATION A subsidiary of

DATA GENERAL New & Used Equipment



(313) 583-4100

TLX: 810-232-4866

Answer Back: MCDATAGEN MAHS

BUY. SELL. TRADE.

McIntyre's

Mini-Computer
Sales Group Inc.

32050 Edward Ave.
Madison Heights, MI
48071

AVAILABLE
3274's
AND
DISPLAYS

AVAILABLE
3262-5
4245-1
PRINTERS

AVAILABLE
3430
TAPES

4341's
BUY
SELL
LEASE

BUY, SELL, LEASE 5120

4300's/3
S/38, S/1

Call Collect:
404-252-7480

DATAMARC
6065 Roswell Rd
Atlanta, GA 30328

S/32
S/34
All IBM Peripherals

IBM For Less.
SYSTEM 36'S
• 2 OR 3 YEAR LEASES
• NEW AND USED PERIPHERALS
• TRADE-INS



TexCom
• Equipment Leasing Services
4201 GARDENDALE SUITE 100
SAN ANTONIO, TEXAS 78229
(512) 690-9825



NF COMPUTER
SALES & LEASING CORP.
950 York Road Hinsdale, IL 60521

CHICAGO
(312) 920-8181

MINNESOTA
(612) 854-1018

NEW YORK
(516) 773-4242

buy sell swap	buy sell swap	buy sell swap	buy sell swap	buy sell swap																		
<h1>DEC</h1> <p>Check out our unbeatable combination— huge inventory at low, low prices.</p> <p>Call toll free 800-328-7000 In Minnesota (612) 894-4020</p> <p>MIDWEST SYSTEMS, INC. 12117 Riverwood Drive, Burnsville, Minnesota 55337</p>			<h2>CLEARANCE SALE DEC* NEW & USED</h2> <table border="0"> <tr> <td>11/24</td> <td>RL01</td> <td>BA11KE</td> </tr> <tr> <td>11/34</td> <td>RL02</td> <td>DD11DK</td> </tr> <tr> <td>11/70</td> <td>RM02</td> <td>FP11A</td> </tr> <tr> <td>11/44</td> <td>RM03</td> <td>FP750</td> </tr> <tr> <td>VAX 730</td> <td>RM05</td> <td>DZ11A</td> </tr> <tr> <td></td> <td></td> <td>DL11W</td> </tr> </table> <p>ALL AT A FRACTION OF LIST PRICE</p> <p>We BUY and SELL all DEC CPU's • SYSTEMS • COMPONENTS MEMORY • TERMINALS</p> <p>CALL 800-854-0350 In Calif: 714-632-6986 or 408-720-8580 P.O. Box 6086C Anaheim, CA 92806</p> <p>DATALEASE <small>sm</small> The DEC SPECIALISTS</p> <p><small>* Registered Trademark of Digital Equipment Corporation</small></p>		11/24	RL01	BA11KE	11/34	RL02	DD11DK	11/70	RM02	FP11A	11/44	RM03	FP750	VAX 730	RM05	DZ11A			DL11W
11/24	RL01	BA11KE																				
11/34	RL02	DD11DK																				
11/70	RM02	FP11A																				
11/44	RM03	FP750																				
VAX 730	RM05	DZ11A																				
		DL11W																				

Buy - Sell - Lease

S/32 IBM
S/34
S/38

CPU's CRT's PRINTERS
ALL MODELS
PURCHASE / LEASEBACK
SHORT & LONG TERM LEASES

**Computer Marketing
of America, Inc.**
P.O. Box 90907
422 Acklen Park Drive
Nashville, Tennessee 37209

Call: Dick Geyer

1-800-251-2670
In Tennessee: 615-297-7516

CMA MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

→ **NCR USERS**
Are You Thinking
of Trading Up ↑ ?
or Down ↓ ?

Call Us for a Quote



SMITH ANDERSON CORP.
619-340-8688

Authorized **NCR** Systems
Distributor - Nationwide
(New or Used Systems)
71-866 Highway 111
Rancho Mirage, Calif. 92270

IBM 370/125

For Sale by Owner

1 3125-0 Processing Unit 256K
1 3340-A02 Disk Drive
2 3340-B02 Disk Drives
1 3203-2 Printer
1 1416-1 Print Train
1 3410-3 Tape Unit
1 3411-3 Tape Unit
1 3505-B01 Card Reader
1 3525-P01 Card Reader/Punch
7 3348-70 Data Modules

Please contact:
Joseph Gallant
Skinner Vaive
95 Edgewood Ave
New Britain, Ct 06050
(203) 225-6421

COMPUCOM

BUY-SELL-TRADE

RP07-AA \$26,250
RP07-BA \$28,750
RP06-AA \$13,250
RP06-BA \$15,750

COMPUCOM INC.
3404 OAKCLIFF RD., C-4 ATLANTA, GEORGIA 30340
(404) 452-1090/TWX 810-757-0202

BUY-SELL-LEASE IBM SYS/34

- IMMEDIATE DELIVERY
- GUARANTEED M/A
- SHORT TERM RENTALS
- PERIPHERALS
- FEATURES-UPGRADES



MARION
84 KENNEDY STREET
HACKENSACK, N.J. 07602

(1-800) 631-1914
(201) 343-4554
(203) 758-2409

FOR SALE

IBM 4341-L2 with
1870 - Block MPX Channels
9512 - RSF Integrated Modern
AND

IBM 3278-A02 Display Console
with

4632 - Keyboard w/o I/O Interface
Excellent up-time performance.
Available Oct-Nov 1983.

Submit bids to:
J. Kalina

Management Reports, Inc.
23845 Mercantile Road
Cleveland, OH 44122

**BUY
SELL
TRADE**

**DEC
PDP-11**

SYSTEMS
PERIPHERALS
COMPONENTS

dcb DIGITAL
COMPUTER
EXCHANGE INC.
27773 Industrial Blvd., Hayward, CA 94545
CALL (415) 887-3100

BUSINESS OPPORTUNITIES

ATTENTION INDEPENDENTS CONTRACT AGENCIES AND SOFTWARE HOUSES.

Computer Search and Selection, Ltd. is a very successful U.K. employment agency projecting an annual turnover of 7,000,000 U.S. dollars in their third year of business, at present supplying contract computer personnel solely to major European installations.

In keeping with our current expansion plans, we are looking for established agencies throughout the U.S.A. with which to supply experienced contract consultants on an exclusive basis.

If you feel that we can be of service and would like to take the matter further, please either write via our head office or telephone Tony Cotton or John Sharpe on: 011 44 442 40761.

Computer Search and Selection, Ltd.
Hamilton House
Hemel Hempstead
Hertfordshire
England

Telephone: 011 44 442 40761
Telex Number: 825042 CSCL G

AMERICA'S LEADER IN BURROUGHS EQUIPMENT

NOW OFFERS
OVER \$2,000,000
IN OWNED

BURROUGHS EQUIPMENT
FOR IMMEDIATE DELIVERY
B1800 - B7800

ALL MEMORY, DISK, TAPE,
MT's, TD's, PRINTERS
GUARANTEED BURROUGHS
MAINTENANCE

602-264-5151

COMPUTER MARKETING CORPORATION
5651 NORTH SEVENTH STREET
PHOENIX, ARIZONA 85014
TLX 163-712

MEMBER COMPUTER DEALERS & LESSORS ASSOCIATION

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guarantee.
Full Reels. All External Labels Removed
Guaranteed for use at 800 BPI through
6250 BPI

2400' Reel \$4.95 ea.
1200' Reel \$4.25 ea.
600' Reel \$3.50 ea.

All Tapes with Hanging Seals

We pay freight on orders over 200 tapes.
All orders shipped within 48 hours.
Call or Write

Computer Tape Mart
44A Seabro Avenue
N. Amityville, New York 11701
[516] 842-8512

The Bulletin Board

Buy • Sell • Lease

Buy • Sell • Lease

Buy • Sell • Lease

Buy • Sell • Lease

IBM

FOR SALE
3278-2
Available Now
Call Bill Cahill
(914) 238-9631

WANTED
3370
All Models
Call Howard King
(914) 238-9631

SYSTEM 34
For Sale
Model F37
3262 Attach Feature
Workstation Expansion
Call Jerry Rickus
1-800-282-2378
In CA 1-800-221-6681

FOR SALE
IBM System 34
F-25
256 K Main Memory
128 MB Disk
2 D Diskette, Feature 4901,
1110, & 5811
Call Bob Cayle 617-485-3060

SYSTEM/36
Check Our GREAT Lease Rates
SYSTEM/34
We want to buy
MIDLAND FINANCIAL
612-559-7171

FOR SALE OR LEASE
SYSTEM 38
Model 581
3 Months Old
615-588-1863

For Sale
IBM 5110
32K Memory
2 Diskette Drives
Printer
W.L. Swafford, C.P.A.
P.O. Box 82
Amarillo, Texas 79105
(806) 373-4435

SYSTEMS 36
LEASES
RATES LOWER THAN PRIME
PROCOM
(212) 279-1717

SYSTEM 36
Available Today
Plant order #372DYY
Express Leasing Inc.
(619) 489-7800

SYSTEMS 34/38
Lease or Sale
WANT TO BUY S/34's
(FOR INVENTORY)
Models & Peripherals
WE PAY CASH
LEAS PAK INTERNATIONAL
Tel.(817)268-0023

IBM
SYSTEM/36
Leases-24 or 36 Mos.
* S/34 Trade-ins *
STAR DATA SYSTEMS
(512) 822-8582

For Sale or Lease
Qty 3278-2
4621 • 4622 • 4627 • 8K0731
As low as \$30/month
3274-A31/C31
Call SYSCOMP Calicut
(813) 790-4310 (612) 292-9922

BUY-SELL-LEASE
CRT's & Printers
5291's, 5224's, 5225's
Available immediately with complete
IBM systems. Call regarding our flexi-
ble lease plans.
CERES CAPITAL CORP.
(212)279-4467
(713)827-7724

S/34 Upgrades
5 to 7 Disk, Avail. Now
S/38, S/36 Leasing
w/Trade-ins
3274-10, 1C, Avail. Now
Vargo Companies
313-254-2850

IBM 3777-1
With 3203-3 & 2502-A03
Available Immediately
For Sale Or Lease Short Term
Call Jim Hill
(408) 446-9619
The Investments Inc.

Buy • Sell • Lease
IBM
Cougar Computer Corp.
Suite 219
26250 Euclid Office Plaza
Euclid, OH 44132
(216) 261-3500

PRINT TRAINS
IBM 1416 & 3216
Bought - Sold - Lease
Repaired - Reconditioned
COMPU-ACT COMPANY, INC.
(813) 863-2461

WANTED IMMEDIATELY
SYSTEM 38
Model 461 with 3370 attachment and
3411 attachment and communications.
Call Bill McGhie
(901) 372-2622

FOR SALE IBM SERIES 1
Processor #4955 512K
Rack Enclosures #4997
Qty. 2 3101 Terminals
Qty. 1 Floppy Disk Drive
CDC SMD Disk 127MB
CDC Matrix Printer 200CPS
CDC Disk Tracks
Call (518) 798-3744

HEWLETT PACKARD

FOR SALE OR RENT
HP 2621A \$900 \$90/MO.
HP 12966A \$550 \$55/MO.
BOTH \$1350 \$135/MO.
HP 7906S \$6000 \$600/MO.
HP 13037 \$2950 \$295/MO.
BOTH \$7500 \$750/MO.
CRISIS COMPUTER 408-727-4431

HP 3000
BUY & SELL
Complete Systems
Memory - Terminals
Disk Drives - Tape Drives
Miscellaneous Parts
ComAn Corporation
(Formerly Finley & Associates)
(800) 643-4954
(213) 458-2843

AIRBORNE
DATA SYSTEMS
WE BUY AND SELL
HEWLETT PACKARD
1000 • 2000 • 3000 • 9800 SERIES
Systems • Peripherals
PO Box 3784 Sonoma, CA 95370
(709) 533-2400
FAX Available

Buy-Sell-Lease
HP3000 3X, III, 4X
and related peripherals
Call Carol
CSU INDUSTRIES, Inc.
516-239-4310

TERMINALS **TERMINALS**
IN STOCK
Call Bruce or Jean For Details
PVF
(301) 948-2684

WANG

2200 **BUY-SELL** **OIS** **VS**
Systems in Inventory **VS/80**
VS/100 **LVP** **OIS/130A**
OIS/140 **And Peripherals**
GEM
(800) 277-8230

WANTED
Used, Excess
WANG Parts, Equip't.
OIS - VS - WP - 2200

FOR SALE
2256-C Brand New! \$4,200
2280/6580 Equip "Phnx" \$7,800
2265V-1 Equip (Pre-owned) \$4,800
2265V-2 Equip (Brand New) \$12,900
(617) 372-8536
CFR Associates, Inc.
18 Granite Street
Haverhill, MA 01830

ISN'T IT TIME
YOU MANUFACTURED
YOUR SOFTWARE?
VS COBOL
COMPUTER AIDED
PROGRAMMING
CAP Speeds Development
CAP Improves Control
CAP Reduces Maintenance
CAP Enforces Standards
NETRON INC.
99 St. Regis Crescent North
Downsview Ontario, Canada M3J1Y9
(416) 836-8333

FOR SALE
WANG WPS-30
Refurbished
Word Processing System
Inc: CPU, 10 Meg Disk, Wk. Sta.
& Daisy Pk. \$9,900
617-372-8536
Mr. Dwight Krantz

VS SOFTWARE
FREE
SOFTWARE OFFER +
ANTI-GLARE FILTER
Send for VS Product Brochure:
Microcomputer Interactive Systems
6550 Firestone Blvd.
Downey, CA 90241
24-Hr. Number (213) 862-1605

DEC

DEC BARGAINS
BDV11-AA \$485
KK11-B \$2875
PDP 11/34A-DC \$3350
RX11-BA \$1185
VAX 1MB MS730-CA \$3,950
VAX 1MB MS750-CA \$3,950
11/24A CPU Set \$1,585
11/44 KE44-A 'CIS' \$2,975
MS11-MB, 11/44 256KB \$1,475
DZ11 MUX Brd. \$1,125
DR780-AA \$11,200
4A-MS780-C Spares Kit \$7,800
MSV11-PK \$1175
MSV11-PL \$1575

CALL RAY
(617)275-8800
Call For Your DEC Needs
861-C.....\$300 BA11-KE.....\$1,650
DO11-CF.....\$350 DL11-W.....\$425
DZ11-A.....\$2,195 H75A.....\$295
RH780.....\$5,995 RKV11.....\$595
RPO6-BA\$16,000 TU45-KE.....\$3,995
Pacific Computer Sales, Inc.
(408) PDP-1170
Telex 173337

DEC "RAINBOW"
192K MEMORY EXTENSION
\$599
Interchangeable with DEC PC11X-AB
1 year warranty, heat cycled
INTERMEDIA SYSTEMS
(408) 996-0900

FOR SALE
VAX 11/780 1.5MB/FPA 1
TU77 1 3
RM03 1 3
DZ11 1 3
LPT1-CP 1 3
VMS, COBOL, FORTRAN,
DTR-11, BASIC, FMS
Philip Taylor (303) 231-0317
Available in July

DEC SYSTEMS
11/03 systems w/RL01 disk, LA180
printer, 64KB memory, RT-11
license \$4,500
Complete packaged 11/23 systems
with dual RL02 \$12,500
LA180 pps, winterface & cntr. \$500
Other Configurations CALL
E.E.C. Systems Inc.
(617)443-5106

USED DISK PACKS
Guaranteed
RL01, RK06, RK07
Used VT52 CRT's
ADM-36, New
1134A, Used
(701) 237-0689

DEC SPECIALS
(1) 11/70 w/1/2MB MOS,
Dual H960 Cab
• RPO7-AA, Call
• TOL77-AB, Call
• TS11-CA, Call
• RM05-AA, Call
• VAX 11/730, Call
SEVCO INC. (617) 435-6938

BUY • SELL • TRADE
11X44-CA \$24950 KDF11-AA, \$ 875
1124-AA.....\$9995 MS11-LB.....\$ 600
CR11.....\$ 895 MSV11-DD.....\$ 295
DLV11-J.....\$ 450 PC11.....\$ 885
DMC11-AL \$1195 RPO4-AA.....\$2495
DMC11-MD \$1095 RPO4-B/C.....\$2995
NEW YORK COMPUTER EXCHANGE
(516)752-8686 (800)645-9109

DEC NEW & USED
BUY — SELL — EXCHANGE
Systems • Processors • Memory
Options • Peripherals • Modules
LAKEWOOD COMPUTER CORP.
3288-9 Kaler St., Suite 100, CA 90608
(408)266-2545

DEC MEMORY SWAP
Trade MS11-LB and MS11-LD or
Mosdek equivalent and cash.
We pay \$200 for each LB and
\$400 for each LD Swapped.
Call Jere or John at
Minnecomputers, Inc.
(612) 884-6601

DEC Equipment
New And Used
PDP 8's & PDP 11's
Repair parts, small options
and industrial controllers.
This months special RK05-JAA, \$600
Paul D. Anderson & Assoc. Inc.
(217) 586-5047 Ask for DeEtta

DEC PDT's
PDT 11/150's priced
from \$1450
Call Jere or John at
Minnecomputers, Inc.
(612) 884-6601

BURROUGHS

BUY SELL LEASE
All Systems & Peripherals
AVAILABLE
• B1855 Sys • B1955 Sys
• B90s • B900s
(Configured To Your Specs.)
SPECIAL: B1955 MEMORY
• SRI Terminals model 190 & 110
• TD830s, MT9830s, MT955s
• 206 & 207 Style Disk Drives
• Various Tape Sub-systems
• Memory Upgrades
• Printers \$245 & \$249 Styles
Guaranteed Burroughs Maint.
Depot Maintenance Available
COMPUTER PROVISIONS
(216) 292-5774
(Member ISDA)

BUY • SELL • LEASE
B1700 • B1800 • B1900
(Custom Config. Install. Avail.)
B20 through B7600
206/207/225/225 Disk
850/840/7749 Printers
Mag Tape Subsystems
TD830 • MT9830 • SRI • Datamox
TUOC-CPTT Terminals
Installation & DEPOSIT M/A Available
UPP Corp. (312) 278-1160

SPERRY UNIVAC

FOR SALE OR LEASE
UNIVAC 5180 MODEL 3
1 MB Memory
4 8417 Fixed Disks
1 8422 Diskette Drive
1 789 Printer (840 LPM)
5 3560 Local Workstations
6 3560 Remote Workstations
1 8538 Terminal Multiplexor
Price Negotiable

NEW UNIVAC 1100/61 C2
Available immediately, ITC Available,
Maintenance Guaranteed, Very Large
Discount - Configuration Includes: 3
(3) MB Processor, 2,000 MB Disk (2 x
4), (2) 6,250 Tape Drives (U-36), 1200
LPM Printer, 750 LPM Printer, GCS, 7
Ports and Modems.
Direct From Owner
(612) 451-4361 or (612) 451-5275

V-77 800 SYSTEM
(2) 258K CPU w/2 Pages WCS
(2) 8433/20 200 MB Disk Drives
(4) 10 MB Disk Drives
(2) 800 bps Tape Drives
(2) 800/1500 bps Tape Drives
(1) 300 LPM Printer
(1) 600 LPM Printer
THE EXCHANGE (208)644-7000
Ask for TOM BASS

DATA GENERAL

NPA SYSTEMS INC.
BUY, SELL, LEASE
Fully Stocked 10,000 sq. ft. warehouse
Services available in New York
Call for Price Catalogue
(516) 467-2500

M600 System Call
8708 2MB Mem. Call
8703 512KB M/8000 Mem. \$3,100
6060 Disk Drive \$10,500
6061 Disk Drive \$14,500
8021 Tape S/S \$4,500
Much more unlisted equipment, call
International Computing Sys.
(612) 941-2941
We buy/sell all makes of computers

Your ad
can be seen
here for
\$115.00

MISC.

BUY AND SELL
NEW • USED • SURPLUS
Data General Digital
PDP11/70 CRT Terminals
Data Products CDC Disk
TI Terminals Hewlett Packard
Diablo Wangco
STC Tn Density For DEC VAX
SYNTEL CORP. (819) 781-3021

Buy • Sell • Lease
DATAPoint
Cougar Computer Corp.
Suite 219
26250 Euclid Office Plaza
Euclid, OH 44132
(216) 261-3500

BASIC FOUR

BUY **SELL** **TRADE**
BASIC 4
Systems, Peripherals,
or Components
Suzanne Enterprises Inc.
ALETA ENTERPRISES INC.
16 Southward, Irvine, CA 92714
(714)552-3559

MODEMS

MODEM SALE

**SUPER SAVINGS ON
LEASED LINE MODEMS**
2400 bps *** \$427
4800 bps *** \$1298
1200 bps IBM Loop type • \$629
2400 bps IBM Loop type • \$682
Previously owned,
refurbished as new,
12 month warrantee
Call RMI Now
at (617) 682-0176

CODEX MODEMS

14.4 KB/Sec.-4
9.6 KB/Sec.-8
6 month warr.
Built-in multiplexers
Pick-up lease at 9.6-\$150/month
14.4-\$215/month
or purchase for balance owed
Call Barry at (901) 864-0096

MISC. SYSTEMS

PRIME 550
Complete system, memory, 2 ter-
minals, disk drives and tape
drives, URC W/450LPM printer,
sell or assume lease.
Call: Frank R. Komar
Check Check, Inc.
(812) 423-0459.

HONEYWELL

LEVEL 6 & DPS 6 EQUIPMENT
NEW & REBUILT
Systems • Peripherals • Memory
CRT's • Applications Software
SUBSTANTIAL DISCOUNTS!!
Boudreau Computer Services Ltd.
130 Beaverhill Rd.
Northboro, MA 01532
(617)393-6839
TWX 710-347-7574

L62, L64
L6000, L6600
PERIPHERALS
TERMINALS
URS
80 Montvale Ave.
Stonham, MA 02180
(617)438-4300

DISK DRIVES AND PACKS

CDC DISK SPECIALS
9766 300MB New \$10,950
9766 300MB Demo 9,500
9775 675MB Fmd 15,900
9762 80MB Used 3,700
9762 50 704Z Kita 285
Fujitsu 104/4MB Stock
All Models in Stock • Buy and Sell
All Warranted • Subject to Prior Sale
SYNTEL CORP. (819) 781-3021

NCR

NCR 7750 DIPS System
2-7750 Prod Machines w/Microfilmers
12 pockets ea. 1 w/Automatic Feed
6980 Processor w/128K
796-101 CRT w/260 Thermal Printer
C856 Disk Drives 11 MBMB
8440 Matrix Printer
7330 Mag Tape Unit
7622 Cassette
NCR 3800 PK 3 Cassettes
Contact Jim Gilmore 208-338-5700

SOFTWARE FOR SALE

PDP-11 & VAX USERS

Make your mini perform like a mainframe

High performance. You need it when you go on-line. And you get it with CYX. You don't need a mainframe to build high performance on-line application systems vital to your day-to-day operations. Not even when you have a large number of concurrent users or a huge data base. With CYX, your mini will deliver the kinds of throughput rates and response times you once could only get with a mainframe.

The CYX Transaction Processing System gives you high performance and reliability because it:

- Manages block mode communications using 3270 (or compatible) terminals and fully buffered DVII (or compatible) multiplexors.
- Keeps frequently accessed records in a dynamically controlled record cache.
- Synchronizes concurrent accesses at the record level.
- Optimizes disk throughput by distributing files across multiple drives.
- Reorganizes the data base dynamically.
- Allows spawning of frequently used processes.
- Provides transaction rollback, duplicate data recording, data journaling, and automatic restart/recovery for high reliability and system integrity.

Find out how to get top on-line performance with CYX and your PDP-11 or VAX by talking to Cytrol today.

"High performance software for vital business needs"

cytrol

4570 West 77th St., Edina, MN 55435 Phone 612/835-4884
In the Northeast, contact: Russell Gloor 914/782-7822

SOFTWARE

DATAPOINT FINANCIAL APPLICATIONS "DOS and RMS COMPATIBLE"

- Accounts Receivable
- Accounts Payable
- Payroll Processing
- Order Processing
- Inventory Control
- Fixed Asset Depreciation
- Job costing w/B.O.M.
- Processing
- Distribution
- Sales Analysis
- Purchase Analysis
- Personnel Reporting
- Billing (Standard & Progressive)
- Purchase Order Management
- General Ledger
- Check Reconciliation
- Club Accounting

ALL MSG SOFTWARE INCLUDES:

- Complete Databas
- Source Code
- 6 Month Warranty
- Full Documentation
- Camera Ready Forms

OVER 600 USERS IN 40 STATES & CANADA
Call or write for our FREE brochure & pricing schedule

MSG

MINI-COMPUTER SUPPORT GROUP, INC.
23209 MILES ROAD WARRENSVILLE HTS., OHIO 44128
(800) 253-6000

IBM S34-S36 Programmers

Tired of DFU?

Try: Design Aid Program

- Prints file specification documentation
- Generates and compiles S and O specifications
- Generates and compiles complete RPG update programs, two logical forms to choose from
- Builds the file and generates the OCL if desired
- File specification source maintenance thru normal SEU
- Supports packed data, subscripted data and DUP functions

ADVANCED DATA SYSTEMS
Free brochure

D.A.P. writes RPG update programs for you that are ready to run. The generated programs may be modified to include edits or any other customizations. Typical generation time for a 15 data element file is 20 minutes; 15 minutes for data entry; 5 minutes run time.

EASY TO
INSTALL AND
USE

\$500.00

4830 Wagon Wheel Road
Carson City, NV 89701 702 882-7839
S36 version available in August 1983

Before you change computers, Call 800-558-5148*

- COBOL to COBOL
- FORTRAN to FORTRAN
- DOS ALC to OS ALC
- Plus FREE "Conversion With No Surprises" brochure.
- RPG/RPG II to COBOL
- CCP to CICS
- NEAT/3 to COBOL

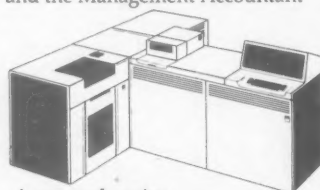
DASD

PEOPLE/PRODUCTS/RESULTS
DASD Corporation • Corporate Services Center
9045 North Deerwood Drive • Milwaukee, WI 53223 • 414-355-3405

Member of the Cap Gemini Sogeti group

*In Wisconsin, call 414-355-3405, collect.

Designed specifically for the IBM System/38 and the Management Accountant



A comprehensive
**General Ledger,
Financial Reporting
and Budgeting System**
with an integrated, optionally available
Accounts Payable System

DHDial Company

Financial Accounting and Reporting Systems

Murray Financial Center, Suite 465
5550 LBJ Freeway, LB-1
Dallas, Texas 75240 • (214) 458-0987

Save time and money on
application development
for your

IBM SERIES/4

Call or write for information on PXS, the most widely used productivity tool for Series/4 users — over 1000 installations.

H & A Computer Systems
30 Hotelling Place #204
San Francisco, CA 94111
(415) 434-3517

SERIES/4 SPECIALISTS

VAX PDP-11 Application Software

- General Ledger
- Accounts Receivable
- Accounts Payable
- Payroll
- Job Cost
- Order Entry
- Inventory
- Fixed Assets
- Client Writeup
- Automatic Restart
- Tailorable
- Multiuser
- Multitasked ISAM
- RMS Files
- Support Hotline
- Security System
- User-defined Forms
- Fully Documented

• Phone Demonstrations
• \$1,000 to \$3,500/module



Computer Share
3824-50th Street
Lubbock, Texas 79413
(806) 792-3785

Now available on TYMNET

SPREADSHEET/WANG VS

Financial Planning, Forecasting, Budgeting, Profit & Cash planning, Investment Return Analysis, etc.

- PHIMOD 1 \$ 850 per CPU copy
- PHIMOD 2 \$1250 per CPU copy
- PHIMOD 3 \$1490 per CPU copy
- Consolidation & Interface Program
- PHICAT 1 \$ 500 per CPU copy
- PHICAT 2 \$ 980 per CPU copy

Demo diskette is available.

Soft Pro Systems

4121 Macdonald Ave., Richmond, Ca.
94805 (415) 234-5440

SYSTEM 34/38

Every organization that borrows or loans funds should have our powerful financial amortization system. System provides accurate information on loan activity, balloon payments, 365/366/360/ rule 78 scheduling, APR, GEM, changing interest rates. Variable periods & zero payments. All standard plus much more. Buy system at fraction of development cost. 100% guaranteed.

Albert Lee Computer Services, Inc.
The Quality & Responsive Software Supplier

1510 Lone Oak Road
Eagan, Minnesota 55121
(612) 452-8840

**SELL
YOUR
SOFTWARE
IN THE
CLASSIFIED
PAGES OF
COMPUTERWORLD**

Call
800-343-6474
(or 617-879-0700)
for more
information

software for sale

software for sale

software for sale

software for sale

software for sale

Changing Computers?

Retain your SOFTWARE INVESTMENT

Dataware's conversion approach provides the solution to management's conversion problems and facilitates the recovery of the initial capital investment in systems development.

- COBOL to COBOL
- AUTOCODER/SPS to COBOL
- EASYCODER/TRAN to COBOL
- BAL/ALC to COBOL
- DOS/ALC to OS/ALC
- PL/I to COBOL
- RPG/ALC to COBOL
- RPG/ALC to PL/I

Faced with Conversion?
Call or write today

The Conversion Software People
Dataware, Inc.

2565 Elmwood Avenue
Buffalo, New York 14217
Phone (716) 876-6722
TELEX: 91519

IBM SYSTEM/38 BUILDING BLOCK SOFTWARE SYSTEM

RMS/38 offers full range of integrated applications for distribution, manufacturing and financial users. On-line systems using data base management. Menu driven. User friendly. RPG III code. Documentation and support. Ready to go. Ready to grow.

Call: (312) 932-2200

PCR professional computer resources

2021 Midwest Road, Oak Brook, IL 60521

SOFTWARE WANTED

SOFTWARE WANTED

Large Multi-Million Dollar Environmental Centre

Requires A

LABORATORY INFORMATION MANAGEMENT SYSTEM

Must Provide:

- Log-In Sample Information
- High Level Inquiry Language
- File Updating
- Various Calculation Capabilities
- Data Capture From Laboratory Instruments
- Submission/Specimen/Sample Management
- Employee And Sample Scheduling
- Extensive Quality Control
- Data Access Security
- Archiving Of Data
- Backups Of Present And Historical Data
- External Communication Capabilities
- Daily, Weekly, Monthly Submission Summaries
- Exception Reports
- Flexible Report Generation

Respond Immediately To:

Jane Sacket, Michael Cisseman,
Or Rosanna Zaluska
Telephone: (408) 532-0761 Collect
Telex: 007-42783

ALBERTA ENVIRONMENTAL CENTRE
Vegreville, Alberta, Canada
T0B 4L0

Need general accounting software for IBM System/38?

We've simply solved your problem.

LAWSON ASSOCIATES has solved it with the first general accounting software specifically designed for IBM System/38. Not merely compatible, but state-of-the-art to fully utilize your computer's capabilities. Compare. You won't find a total software solution like it anywhere else.

DESIGN FEATURES:

They include: on line systems using data base management; menu driven, user friendly programs written in RPGIII, the System/38 language; and integrated modules. Their

benefits: ease of installation and use, plus maximum employee productivity.

INTEGRATED MODULES:

Those available include: General Ledger and Report Writer/Accounts Payable/Accounts Receivable/Fixed Assets/Payroll/Purchase Order Entry/Inventory Control

SERVICE FEATURES:

Fully documented and supported. Onsite training and implementation. One year warranty. Available now for immediate installation.

For more information, please call or write:

NATIONAL SALES:
Lawson Associates
2021 East Hennepin Ave.
Minneapolis, MN 55413
(612) 379-2633

IN TEXAS:
Lawson Associates
5001 LBJ Freeway, Suite 175
Dallas, TX 75234
(214) 233-4474

LAWSON ASSOCIATES
WE SIMPLY SOLVE PROBLEMS

FREE DEMO DISKETTES FOR IBM 34, 36 & 38

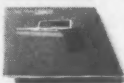
Full user documentation, too!
Try any of our application software products—G/L, A/P, A/R, F/A, P/R. See for yourself how easy they are to use as you load them, test them, see the screens, input your own data, run reports. Brochures are fine, but seeing is believing! And the cost to try us? ***0!** No up-front dollars or signed agreements... no pressure... no cost! Just call and order the demo you desire. Pricing information will be included. So if you're serious about software...

GET YOUR "HANDS-ON" HARRIS SOFTWARE TODAY!!



HARRIS DATA SERVICE, INC.
11629 W. DEARBORN AVENUE
MILWAUKEE, WISCONSIN 53226
(414) 475-1760

Other Offices
And
Distributors
Internationally



Elegant Software
for IBM S/34 & S/38

General Accounting
Financial Reporting
Accounts Receivable
Accounts Payable
Order Processing
Inventory Management
Sales Analysis
Job Cost

J. D. Edwards & Company

4949 S. Syracuse Street/Suite 5500
Denver, CO 80237
303/773-3732

Payroll/Personnel
Property & Equipment
Report Writer
Oil & Gas
All Systems are:
RPG II/RPG III
Data Base
Interactive

Dallas — 214/458-0636
Northern California — 415/697-7754
Southern California — 714/751-5302

IBM 34/36/38

Para Research offers a different marketing approach for software. We provide the best software packages at lower prices. We do this to obtain volume sales, a larger user base and to encourage user feedback. This approach and the input of our many users have made us what we are today: the world's largest distributor of System/34 software. All packages are completely documented.

WORD PROCESSING

Easy Text, a new word processing system for the IBM System/34 or 36, presents an easy-to-use system with on-line documentation. Easy Text is so "user friendly" that users with no experience can generate letters, memos, reports and mass mailings almost immediately. Now every workstation on your computer can function as a word processor. Easy Text on the System/34/36 is \$750. On the System/38 it is \$1,500.

Priced at \$1,000, Paratext is the most successful and complete word processing system available for the System/34. There are more than 2,500 Paratext users. Paratext offers full-screen text editor, automatic justification, individual forms design, viewable corrections, heads-down typing, word wrap-around, variable data insertion, label printing and math capabilities. Paratext is also available for the System/38 at \$1,500.

FINANCIAL MODELING

Easy Calc Management System for the IBM System/34 or 36 combines the best features of the best electronic worksheets. Use Easy Calc for budgeting, cash flow analysis and sales forecasting. Build formulas of up to 96 characters. Create worksheets with 52 columns and 999 rows. Consolidate 998 worksheets into one. And Easy Calc's built-in error detection actually pinpoints the exact position that needs correction. Learn Easy Calc in only a few hours. Available for the IBM System/34 at \$1,000, or the System/36 at \$1,500.

Paracalc, a diversified modeling system, calculates budgets, cash flow, sales projections, commissions, production forecasts, anything you can set up in rows and columns. Change one entry and all amounts are recalculated accordingly in up to 24 columns and 400 rows. The "HELP" screen displays all built-in functions and provides the formulas to access each function. Consolidation from many models to one. Return on investment model. Available on the System/34 or System/38 for \$1,000. With over 2,500 users, this is the most successful package of its kind.

GENERAL LEDGER

General Ledger is a fully-automated package for maintaining business records. It offers maximum flexibility, ease of use and a variety of reporting options. Users can produce trial balances; detailed income statements and balance sheets; reports for individual transactions; and all department and expense statements. General Ledger interfaces with other Para Research accounting systems. Available for \$1,000 on the System/34, \$1,200 on the System 36 and \$2,000 on the System/38.

ACCOUNTS PAYABLE

Accounts Payable reduces administrative and clerical costs, while allowing tight control over accounts payable functions. Various management reports provide timely and accurate information on the current status of all payables. The enhanced version allows you to: take a discount amount after discount date; select a single batch of vouchers for updating to open payables file; and report status of every vendor on a vendor analysis report. Available for \$1,000 on the System/34 and \$1,200 on the System/36.

PAYROLL

Payroll reduces clerical costs and gives users control over payroll processing. The employee master files for salary, hours and other payroll items are easy to maintain, and user-friendly prompts provide instructions for each procedure. Payroll will handle 99 companies and will run payroll processing for any combination of companies. Available for \$1,000 in the System/34, \$1,200 on the System 36 and \$2,000 on the System/38.

FIXED ASSETS

Fixed Assets, an easy-to-use depreciation scheduling program helps users produce two-year projections. It figures depreciation for user-specified periods based on the 1981 Economic Recovery Act using the Accelerated Cost Recovery System (ACRS) plus eight other depreciation methods. Management reports track depreciation schedules, report changes in those schedules, give projections over a two-year period. Available for \$1,000 on the System/34, \$1,200 on the System/36 and \$2,000 on the System/38.

ACCOUNTS RECEIVABLE

Accounts Receivable improves bookkeeping efficiency and reduces administrative tasks. This system is available in either open item or balance forward methods. For both methods, the system has cycle billing capability and allows printing of all statements on file or statements for specific customers. You can obtain up-to-date status of customer records, including current balance, aging and credit checking. Available for \$1,000 on the System/34 and \$1,200 on the System/36.

BILLING

The Billing System provides order entry and invoicing capability as well as analysis of inventory and sale of items within your company. You can generate picking ticket listings by warehouse or item number and maintain data on orders before shipping and invoicing. The system places order quantities in reserve until you confirm the order; then reduces the quantity on hand. This allows you to enter freight charges before the invoice is sent. Available for \$1,000 on the System/34 and \$1,200 on the System/36.

INVENTORY

The Inventory System gives your company complete control over inventory, both on hand and on order. The system provides reports to let you know the status of every item at any time. You can determine inventory costs based on four methods: LIFO, FIFO, average cost and replacement cost. Available for \$1,000 on the System/34 and \$1,200 on the System/36.

PARA RESEARCH

Call or write Software Sales, Dept. CW13, Para Research Inc., Eastern Avenue, Gloucester, MA 01930 (617) 546-3446, 514-413.

TIME & SERVICES

Zayre

Computer Services
Now offers
Special Low Rates for
MVS•TSO•CICS•IMS
computer time

CALL: Lynne Harwood
(617) 620-5487

Zayre Corp. Framingham, MA 01701

TIMESHARING AVAILABLE

VAX 11/780-VMS
PDP 11/70-RSTS/E

- FORTRAN, COBOL, BASIC
- DATATRIEVE
- ORACLE ®
- STATISTICAL PACKAGES
- DECNET
- TYMNET ACCESS

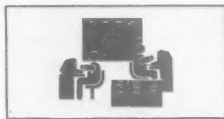
CONTACT:

INSLAW, Inc.
Washington, D.C.
(202) 828-8600

® trademark of Relational Software, Inc.

BNCS... A comprehensive source of Information Processing Services

MULTIPLE IBM 3033's
BACKUP/POWER SUPPLY
MVS-VM OPERATING SYSTEMS
EXTENSIVE SOFTWARE LIBRARY
STATE-OF-THE-ART TECHNOLOGY
NATIONWIDE COMMUNICATIONS NETWORK



<u>Processing Services</u>	<u>Professional Services</u>	<u>Backup/Recovery Services</u>
Batch Processing (Local & Remote)	System & Data Conversions	No Costly Initiation Fee
Online Processing	System Generation	No Fixed Daily Charges
Time-Sharing With Our Software	System Design & Development	Modest Monthly Fee
Time-Sharing With Your Software	Facilities Management Consulting	Shell Site Inquiries Invited

BNCS

Bradford National
Computer Services
1500 Palisade Avenue
Teaneck, New Jersey 07666

Toll Free 800/526-0172
(In NJ Call 201/833-1020)

TIMESHARING VAX 11/780-VMS

- FORTRAN
- BASIC
- COBOL
- DATATRIEVE
- Telnet Access
- Floating Point Accelerator
- Direct Dial

Graphics
Author Programs
Custom Software
Hydrology Softw.
Petroleum Softw.
Low Rates
(Interactive Batch)
Detailed Resource Acctg.

Volume Discounts

7-Day, 24 Hour Service

Contact: Richard Santoro
In-Situ Inc.
209 Grand Ave.
Laramie, WY 82070
(307) 742-8213

Computer Time Services

Convenient Manhattan location
offering a full range of data services including:

4341 II	VM/SP	IBM	CMS	370/158
VS	XEROX 9700 LASER PRINTER			ROSCOE

We have the capability of handling major, long-term accounts at very competitive rates. For more information or to arrange a meeting, please call:

D. Vanier at 212-752-1544

DCSI

Computer Time Brokers & Specialists

- ☐ On-site or remote processing
- ☐ Serving the Tri-State Area

BROOKE COMPUTER CORP.
250 W. 57 ST.
NEW YORK, NY 10019
212/586-0923

VIMAC

Venture Investment
Management Company

12 Arlington Street
Boston, MA 02116
(617) 287-2785
Provides
Equity Seed Capital
to
ENTREPRENEURS
in the
Computer Industry
Confidentiality Assured

DEPOT COMPUTER REPAIRS

DEC-DG
ALL BOARDS
1-2 WEEK TURNAROUND
MEMORIES
POWER SUPPLIES
DISKS PACKS AND TERMINALS
ANY MANUFACTURER

DIGITAL DATA SYSTEMS, INC.
1501 N.W. 85 Ave., Plantation, FL 33313
305-792-3290
1-800-327-8662
TELEX-232005 ATT DIG

COMPUTER TIME & TIMESHARING

- We are time brokers.
- IBM timesharing our specialty.
- Also RJE & batch time.

Call John Rudder at
Computer Reserves, Inc.
(201) 688-5780

Computer Services

4341-2 370/158-3

VS1-CICS-ROSCOE-DOS

REMOTE JOB ENTRY
CICS DEVELOPMENT
CICS PRODUCTION
CUSTOMIZED SOFTWARE

CONTACT JOE BARRETT
(201) 777-3454

15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD RIDGE, N.J. 07075

VAX AND RSTS/E DEVELOPMENT TIME

NO KILOCODE TICK CHARGES - NO CPU CHARGES

\$7/\$14

RSTS/E VAX

PER HOUR
CONNECT TIME

**BUDGET
BYTES**
212-
944-9230

by **Omnicomputer**™
1430 Broadway, New York, N.Y. 10018

BIM 4331-2 DATA CENTER

- DOS/VSE, CICS, PL/I
- COBOL, FORTRAN, RPG
- Remote lines or on-site usage

B I MOYLE ASSOCIATES, INC.

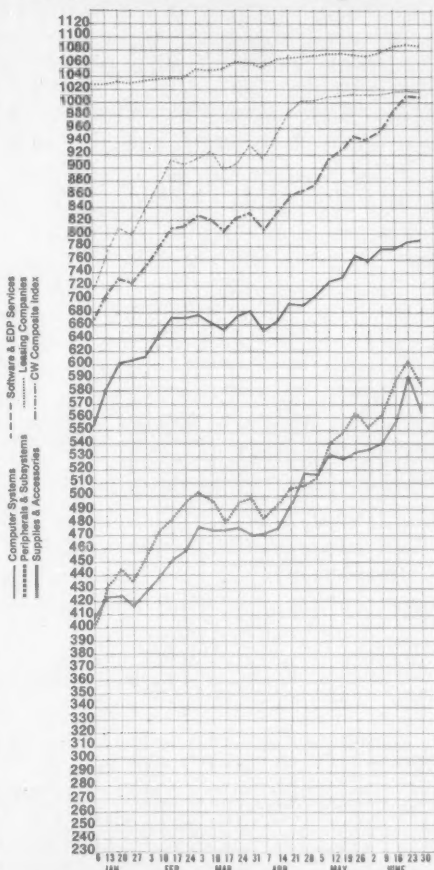
5788 Lincoln Drive
Minneapolis, MN 55436
(612) 933-2885

ADVERTISERS INDEX

Aluminum Case Co.	35
American Bell	16-17
Applied Computer Research	33
Applied Data Research	3
BDS Computer Corp.	9
B.I. Moyle Associates	14
BNR Corp.	52
Comdata Corp.	37
ComDesign	35
Computer Associates	32
Computerworld Buyer's Guide	58
Computerworld Office Automation	39
Computerworld Subscriptions	60
Computerworld Supplement	34
Core & Code, Inc.	14
CRWTH Computer Coursewares	45
CS Computer	47
CXC Corp.	46-47
Datapoint	18
Deltak, Inc.	40,59
Dorlen Products	12
DPMA	57
Dysan Corp.	61
Equitable Insurance	5
Fusion Products	10
General Electric	44
General Research	19,38
Hewlett Packard	30-31,41
IBM-ISC	42-43
ITT Courier	11
Madzar Corp.	38
Management Science America	84
Microdata	36
MicroFrame	38
Molecular Computer	26
MPC	56
MPPi, Ltd.	10
National Systems Labs, Inc.	52
Omni Offices, Inc.	56
Phaze Info. Machines Corp.	13
Professional Computer Resources	28
Raytheon Data Systems	54-55
RMI Company	15
SAS Institute	21,53
Saturn Systems	49
Signal Technology	33,50
Software Corp. of America	12
Software Results	20
Star Technologies and Research	29
Storage Technology	38
Syncsort	7
Technalysis	19
Televideo-Terminals	22-23
Tone Software	19
Topaz Inc.	48
Xerox Corporation	27

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computerworld Stock Trading Index



Computerworld Sales Offices

Vice-President/Sales/Donald E. Fagan
COMPUTERWORLD, 375 Cochituate Road, Box 880,
 Framingham, MA 01701
 (617) 879-0700

BOSTON SALES OFFICE (617) 879-0700
 Northern Regional Manager/Chris Lee
 Sr. District Manager/Ed Marecki, Jr.
 District Managers/Joe Fitzhugh, Jim McClure
 Sales Assistant/Kathy Doyle
COMPUTERWORLD, 375 Cochituate Road, Box 880,
 Framingham, MA 01701

CHICAGO SALES OFFICE (312) 827-4433
 District Managers/Arthur Kossack,
 H. Newton Barrett, III
 Sales Assistant/Jean F. Broderick
 Northern Regional Manager/Chris Lee
COMPUTERWORLD, 2600 South River Road, Suite 304,
 Des Plaines, IL 60018

NEW YORK SALES OFFICE (212) 967-1350
 Eastern Regional Manager/Mike Masters
 Sr. District Manager/Doug Cheney
 District Managers/Ray Corbin, Joan Daly
 Account Executive/Fred Lo Sapio
 Sales Assistant/Gale M. Paterno
COMPUTERWORLD, Paramus Plaza 1,
 140 Route 17, North, Paramus, NJ 07652

LOS ANGELES SALES OFFICE (714) 556-6480
 Regional Manager/Jim Richardson
 District Manager/Bob Hubbard
COMPUTERWORLD, 18008 Sky Park Circle, Suite 260,
 Irvine, CA 92714

SAN FRANCISCO SALES OFFICE (415) 421-7330
 Western Regional Manager/William J. Healey
 Account Managers/Barry Milione, A.G. Germano,
 Theodora Franson
 Account Manager, Classified/Eileen Dunn
COMPUTERWORLD, 300 Broadway, Suite 20,
 San Francisco, CA 94133

ATLANTA SALES OFFICE (404) 394-0758
 District Manager/Jeffrey Melnick
 Eastern Regional Manager/Michael Masters
COMPUTERWORLD, 1853 Peeler Road, Suite D, Atlanta,
 GA 30338

CLASSIFIED ADVERTISING (617) 879-0700
 Al DeMille, Bill Cadigan
COMPUTERWORLD, 375 Cochituate Road, Box 880,
 Framingham, MA 01701

For foreign sales offices, see masthead
 on Page 2.

CW COMMUNICATIONS/INC.

Board Chairman/Publisher

Patrick J. McGovern

President

W. Walter Boyd

Senior Vice-President

Lee Vidmer

Group VP-Communication Services, Jack Edmonston. Group VP-Circulation, Margaret Phelan.
 VP-Marketing, Donald E. Fagan. VP-Finance, William P. Murphy.
 VP-Editorial, John Whitmarsh. VP-Special Publications, Robert Ziegel.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701
 Phone: (617) 879-0700, Telex: 95-1153.

SALES Vice-President, Donald E. Fagan. Corporate Advertising Administrator, Frank Collins. Display Advertising Supervisor, Anne Hadley.
 Display Advertising, Tracey Eastman, Pam Valentinas, Laura Kentley, Alice Longley.
 Classified Advertising Manager, William J. Mills.

COMMUNICATION SERVICES Group Vice-President, Jack Edmonston. Director Research, Kathryn Dinnen.
 Sales Promotion Manager, Noreen Kimball.

PRODUCTION Production Director, Peter Holm. Production Manager, Marlene Stibal.
 Supervisor, Trish Gaudette. Systems Manager, Tom Plau.
 Typesetting Manager, Carol Polack. Art Director, Tom Monahan.

CIRCULATION Group Vice-President, Margaret Phelan. Circulation Manager, Barbara Jeannetti.
 Service Representative, Peggy Kelly. Assistant, Carmela Priante.

Computerworld can be purchased on 35 mm microfilm through University Microfilms Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich.
 48106. Phone: (313) 761-4700. Computerworld is indexed; write to Circulation Dept. for subscription information.

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JUNE 29, 1983

All statistics compiled
 computed and formatted
 by
 TRADE QUOTES, INC.
 Cambridge, Mass. 02139

PRICE							PRICE							PRICE						
E	C	H	1982-83	CLOSE	WEEK	WEEK	E	C	H	1982-83	CLOSE	WEEK	WEEK	E	C	H	1982-83	CLOSE	WEEK	WEEK
			RANGE	JUN 29	NET	PCT				RANGE	JUN 29	NET	PCT				RANGE	JUN 29	NET	PCT
			(1)		CHANGE	CHANGE				(1)		CHANGE	CHANGE				(1)		CHANGE	CHANGE
COMPUTER SYSTEMS							SOFTWARE & EDP SERVICES							COMPUTER DEVICES INC						
A	ANDAL CORP		8-30	26 3/8	-3/4	-2.7	O	ADVANCED COMP TECH		1-8	8	+2	+33.3	O	COMPUTER TRANSLUCER		4-21	12 1/4	-2 1/8	-14.7
N	BURROUGHS CORP		28-58	55 5/8	-1 3/8	-2.4	O	ADVANCED SYSTEMS INC		8-30	30 1/4	+3/4	+2.5	N	CONRAD CORP		17-38	22 3/4	-1 1/4	-1.9
O	COMPUTER AUTOMATION		7-17	15 1/2	+1/4	+1.6	O	AGS COMPUTERS INC		1-7	7	-5	-55.6	O	DATACORP SYSTEMS		16-41	26 1/4	-1 1/2	-5.0
A	COMPUTER CONSOLES		15-47	46	+3/8	+0.8	O	AMERICAN SOFTWARE		22-31	28	-2 3/4	-8.9	A	DATAPRODUCTS CORP		5-12	10 1/2	+1 1/2	+5.0
N	CONTROL DATA CORP		21-62	56 3/4	-2 3/8	-4.0	N	ANACORP INC		8-23	17 7/8	+1	+5.8	A	DATARAM CORP		2-7	14 1/2	-2 1/8	-15.7
N	CRAY RESEARCH INC		20-52	52 1/4	+6	+12.9	N	ANALYSTS INTL CORP		5-20	16 1/4	-3 1/4	-16.6	O	DAVID JARISON CARLYL		3-16	13 1/8	+1 1/4	+1.9
N	DATA GENERAL CORP		20-73	57 1/8	-2 3/4	-4.5	A	APPLIED DATA RES.		6-37	34 3/4	-1/2	-1.4	O	DECISION DATA COMPUT		2-7	3 5/8	-1/8	-3.3
N	DATAPoint CORP		11-36	20 3/4	-1 1/8	-5.1	D	ASK COMPUTER SYSTEMS		12-36	34 1/4	0	0.0	O	DECISION DATA COMPUT		3-16	13 1/8	+1 1/4	+1.9
N	DIGITAL EQUIPMENT		62-122	118 5/8	-2 5/8	-2.1	B	ASTRODYNE CORP INC		5-14	5 1/4	0	0.0	O	DELL DATA SYSTEMS		5-11	10 1/8	-1 1/2	-4.7
A	EECO INC		8-15	13 3/4	-1/2	-3.5	N	AUTOMATIC DATA PROC		21-44	41 1/2	-2 1/8	-4.8	N	ELECTRONIC M & N		18-50	51 1/2	-4	-8.7
N	ELECTRONIC ASSOC.		9-15	13 3/4	-1/4	-1.7	D	C&A COMPUTER ASSOC		5-15	12 3/4	-1 1/2	-10.5	N	EVANS & SUTHERLAND		2-6	2 1/2	-3/8	-2.2
N	FLOATING POINT SYST		18-44	40 1/2	-1 3/8	-3.2	D	COMPUTER ASSOC INT'L		8-33	14 1/2	-1 1/4	-9.8	N	GEN'L DATA CORP IND		6-29	26 3/8	-7/8	-3.2
N	FOXBORO		22-47	41 3/4	-1/2	-1.1	O	COMPUTER HORIZONS		4-30	24 1/2	-5 1/4	-17.6	O	GENERAL TERMINAL CP		1-2	3/4	0	0.0
O	GENERAL AUTOM GRP		1-3	1/4	0	0.0	O	COMPUTER NETWORK		4-10	10 1/8	+1	+10.9	O	GREAT SOUTHWEST INT		2-6	2 1/2	0	0.0
O	GENERAL AUTOMATION		3-16	14 5/8	-1/2	-3.3	N	COMPUTER SCIENCES		11-23	18 7/8	-1 3/4	-8.6	N	HAZELTINE CORP		7-31	24 3/8	-5 1/8	-17.3
N	HARRIS CORP		20-31	44 1/8	+1 1/2	+3.5	O	COMPUTER TASK GROUP		8-22	17 1/2	-1 3/4	-9.0	O	ICOT CORP		3-10	7 1/2	-3/8	-4.7
N	HEWLETT-PACKARD CO		36-96	91 5/8	-5/8	-0.6	O	COMPUTER USAGE		2-22	18 3/4	-1 1/2	-2.4	O	INFORMATION INTL INC		10-22	16 1/2	-1 1/4	-7.0
N	HONEYWELL INC		80-124	114 1/2	-1 3/4	-1.8	N	COMPUTONE SYSTEMS		15-38	18 1/2	-2 1/2	-11.3	O	INTEL CORP		21-76	72 1/2	-3 3/4	-4.9
N	IBM		57-124	120	-3 1/2	-6.8	O	CONSERV CORP		10-20	12 1/2	-1 3/4	-12.2	N	IPLS SYSTEMS INC		7-14	12 3/4	-1/8	-0.6
O	IPL SYSTEMS INC		5-14	12 3/4	0	0.0	D	CONSHARE		6-13	11 1/2	-1/2	-4.1	A	LUNDY ELECTRONICS		7-19	17 3/4	-1/8	-0.6
O	KAGNUSON CORP SYST		2-5	3	0	0.0	N	CULLINET SOFTWARE		12-30	43 1/2	-1 1/2	-1.1	A	MSI DATA CORP		14-36	22 3/8	-1/8	-0.5
N	MANAGEMENT ASSIST		7-18	13 7/8	-3/4	-5.1	O	CYCARC SYSTEMS INC		8-27	23 1/4	+1/4	+1.0	N	NETWORK SYSTEMS CORP		3-6	5 1/2	0	0.0
O	MINI-COMPUTER SYST		1-2	3 1/8	+1 1/8	+56.2	D	DATATAB		6-2	1 1/4	+1/4	+25.0	O	OMEX		20-30	23 3/4	+1/4	+1.0
N	MODULAR COMPUTER SYS		8-16	12 7/8	-2	-13.4	O	DATATRON CORP		2-4	3 1/4	-1/8	-3.7	O	PERMUT CORP		7-14	12 3/4	-1/8	-0.6
N	MOSAIC DATA SCI		10-19	14 3/8	-1	-6.5	N	ELECTRONIC DATA SYST		10-42	37	-3	-7.5	O	RAMTEK CORP		12-26	18	-1 1/2	-7.8
N	NCR		38-125	118 1/2	-3	-2.4	N	INFORMATICS INC		10-34	27 1/8	-1 1/4	-4.4	N	RECOGNITION EQUIP		4-17	15 3/8	+1 3/8	+9.8
N	PERKIN-ELMER		17-35	33 3/4	+3/4	+2.2	D	INSYTE CORP		1-3	1 5/8	0	0.0	N	SECAN DATA		16-33	31 1/8	-1 1/8	-3.6
N	PRIME COMPUTER INC		11-30	23 3/4	+1 5/8	+7.3	N	IPS COMPUTER MARKET		1-2	1 1/8	0	0.0	N	STORAGE TECHNOLOGY		16-33	31 1/8	-1 1/8	-3.6
N	SPERRY CORP		21-60	38 7/8	+3	+8.1	O	KEANE ASSOCIATES		8-15	14 1/2	+4	+28.0	D	SYKES DATAINFORMS		6-27	10 1/8	-7/8	-15.6
O	TANDEN COMPUTERS INC		14-34	30	-2	-6.2	N	LOGICON		12-44	40 1/4	-1 1/2	-1.2	A	TAB PRODUCTS CO		8-29	29 3/4	+3	+11.6
N	TEXAS INSTRUMENTS		71-178	115 7/8	+7/8	+1.5	A	MOORE CORP		12-30	28 1/2	-1 1/2	-5.3	A	TEC INC		6-12	34	-3/8	-1.1
A	WANG LABS "B"		13-42	37 3/4	-2 5/8	-6.5	O	RMOT SCI AMER INC		8-30	28 3/4	-3/4	-1.5	N	TELETRONIX INC		34-80	81 3/8	-3	-3.4
A	WANG LABS "C"		11-42	38	-3/4	-1.9	O	MATHEMATICAL INC		12-28	27 3/8	-5/8	-2.2	N	TELEX		5-31	28 3/8	-1 5/8	-5.4
							D	MATHEMATICAL APP GRP		12-28	28	0	0.0	O	TESDATA SYSTEMS CP		3-14	12 1/8	-3/4	-5.8
LEASING COMPANIES							O	NATIONAL DATA CORP		5-28	23 5/8	-2	-7.8	N	TIMEPLEX INC		7-29	26	-2	-7.1
O	BOOTH FINANCIAL CP		22-55	48	-3	-5.7	O	PANOSOPHIC SYSTEMS		8-30	28 3/4	-1 1/2	-4.9	N	UNION TECHNOLOGY		9-26	22 1/4	-1	-4.1
N	COMDISCO INC		7-37	34 7/8	-2 3/8	-6.3	N	PLANNING RESEARCH		8-21	18	-2 1/4	-10.5	B	WILTER INC		1-4	2	-1 1/4	-11.1
B	COMMERCE GROUP CORP		1-1	1/4	0	0.0	D	POLICY MGMT SYST CP		38-88	58 3/4	-3 1/2	-5.5							
O	COMPUTER INVEST GRP		1-2	1/2	0	0.0	O	PROGRAMMING & SYS		1-8	5/8	-3/8	-8.2							
O	CONTINENTAL INFO SYS		5-32	30	+1/4	+0.9	D	REYNOLDS & REYNOLD		17-47	43 3/4	+1	+2.3							
N	DPF INC		5-14	13 3/8	+1/8	+0.8	O	SEI CORP		11-34	28	+1/2	+1.7							
O	ETEC		1-3	1 1/8	0	0.0	O	SHARED MEDICAL SYST		13-43	38 1/8	-2 1/8	-5.2							
N	LEASAPAC CORP		1-2	1/8	0	0.0	O	SCIENTIFIC COMPUTERS		8-14	12 1/2	-1 1/2	-9.8							
N	U.S. LEASING		18-47	42 1/4	+1/4	+0.5	D	SOFTWARE AG		5-17	10 7/8	-1/8	-1.1							
							N	TYSHARE INC		12-30	10 7/8	-1/8	-5.3							
							A	URS CORP		3-18	17 1/8	-7/8	-9.1							
							N	WYLY CORP		7-17	14	-1	-6.6							
PERIPHERALS & SUBSYSTEMS							P	AN INTERNATIONAL		2-7	5 1/2	-3/8	-6.3	N	AMERICAN BUS PRODS		11-31	29 1/8	-1 7/8	-6.0
							A	ANDERSON JACOBSON		8-28	21 1/4	-3 1/2	-14.1	O	BALTIMORE BUS FORMS		1-2	3/4	0	0.0
							O	AUTO-TROL TECHNOLOGY		8-28	25	+3/4	+3.0	N	BARRY WRIGHT		13-31	27 1/4	-2 3/4	-9.1
							O	BANCITE INC		7-33	18 1/2	+2	+12.1	O	CYBERNETICS INC		1-2	1 1/2	-1 1/2	-25.0
							A	BENTIVE INT'L		4-15	12 3/4	-3/4	-5.5	A	DUPLEX PRODUCTS INC		12-26	23 7/8	-1/8	-0.5
							A	BOLT-BERANEK & NEM		13-78	72 1/2	-2 1/2	-3.3	N	ENNIS BUS. FORMS		18-48	44 1/8	-1 1/8	-3.6
							O	C&A CORP		2-4	2 3/8	0	0.0	N	GEN'L DATA CORP		48-80	84 5/8	-1 7/8	-2.1
							N	C&A CORP		8-28	28 5/8	+1 1/2	+11.9	N	MOORE CORP LTD		28-31	48 1/4	+1/4	+0.5
							N	C&A CORP		8-28	28 5/8	+1 1/2	+11.9	N	NASHUA CORP		8-22	19 7/8	+3/8	+1.9
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9	O	STANDARD REGISTER		11-34	32 1/4	-3/4	-2.2
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9	N	WALLACE BUS FORMS		11-30	27 7/8	0	0.0
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							
							O	C&A CORP		8-28	28 5/8	+1 1/2	+11.9							

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON;
 L=LOS ANGELES; H=HARRIS; O=OVER-THE-COUNTER
 D-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
 (1) TO NEAREST DOLLAR

15 pointed questions to ask MSA or any software supplier

These questions will help you when you sit down with individual software companies.

They're tough questions. Relevant ones. And any supplier who is worth his salt should be able to answer them without backpedaling.

Ask MSA

We'll answer all these questions to your satisfaction—plus any others you may have.

In fact, we're probably the best equipped to answer them. Because MSA is the software company. We offer the most complete line of totally integrated systems in the software industry, including financial, human resource and manufacturing.

So you avoid the headache of trying to tie together individual systems. (And the even bigger headache of adding to them.)

With MSA's integrated systems, there's no unnecessary duplication of data or effort. Reporting is faster. All your company's information is more timely and accurate—and in the right form.

Our technical edge comes from experience

Staying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

This year alone, we'll invest \$25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

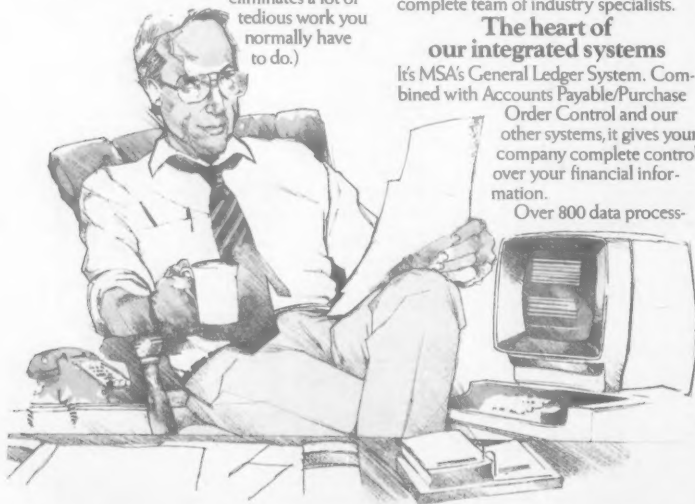
It also gives you a decided advantage over "custom" systems you have to update yourself.

MSA relieves you of that time-consuming burden. We update and enhance your software for a full year. Then we continue this service for a surprisingly low annual fee.

Maintenance includes keeping your system up-to-date technologically. Enhancing it with new features that make it work even harder for you.

And making sure it reflects changes in accounting procedures and government regulations, including 401(k), TEFRA, and FAS52. (That

eliminates a lot of tedious work you normally have to do.)



Save this box. It can help you make an intelligent software decision.

1. Can you offer us a complete range of software systems designed to work together?
Or will we have to piece together a patchwork of systems?

2. Are your systems just record keepers, or can they really help us make decisions?
Can we pull together information from any of our integrated systems? In exactly the form we want it?

3. Can you provide business software for both mainframe and microcomputers?
Do you develop this software yourself or do you simply market it for another company?

4. Are your systems truly online?
How many of our information is current?
How many of your systems are online? How secure are they?

5. Will my company have to be the one that discovers the bugs in your brand new system?
Just how long have your systems actually been used, and how have they been tested?

6. Will you update your systems as technology advances and regulations change?
What are some of your most recent updates? Will you keep us current on regulatory changes?

7. Do your systems really do everything you say they will?
Or will we have to change them or add to them to get the features we want?

8. How long have you been in business?
What are your revenues? What is your growth record? Where will your company be five years from now?

9. How many systems has your company installed?
How many of these were installed in the past six months? How many of your earlier customers are still using—and liking—your systems?

10. Do your financial systems handle unlimited foreign currencies?
Do your financial systems use a common set of currency exchange rates?

11. Can you link our executives' computers directly to the mainframe—so they can get their own information?
Is that software available right now?

12. How will you make sure our own people thoroughly understand your system?
Do you have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?

13. How many of your people specialize in software for my industry?
How many accountants work for you? Human resource specialists? Manufacturing experts?

14. Do your systems have built-in features that make them easier to use?
What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?

15. As my business changes, will your system be flexible enough to change with it?
Or will we have to pay a lot to revamp it? Or even regenerate it?

35,000 days of training

At MSA, we make sure your people have a firm grasp of our systems. Last year alone, we conducted more than 35,000 student days of customer training for over 1,800 companies. At education centers all over the world, as well as at our headquarters.

From training sessions to cassettes to complete, easy-to-understand documentation, MSA provides the most extensive Customer Education Programs in the industry.

And MSA systems are just as friendly as our people. Our online HELP feature actually guides users through our systems, and EASY-SCREEN™ lets them design their own screens without creating data processing nightmares.

If there's ever a question or problem with our systems, MSA customers are always close to service.

Our Account Managers are knowledgeable, responsive, and backed by a complete team of industry specialists.

The heart of our integrated systems

It's MSA's General Ledger System. Combined with Accounts Payable/Purchase Order Control and our other systems, it gives your company complete control over your financial information.

Over 800 data process-

ing specialists, accountants, and financial experts work together to make MSA's financial systems the most advanced and most highly integrated in the industry.

MSA has the answers

Whatever your size—whatever your business—MSA has a total software solution.

We'll provide the highest quality integrated online software.

We'll tie your business and manufacturing software systems together, using our exclusive Extended Closed Loop™ manufacturing system.

We'll provide business software for your microcomputers, through our Peachtree Software Company.

We'll even link your microcomputers to your company's mainframe—with MSA's Executive Peachpak™ application

MSA ready-to-install applications software

1. General Ledger
2. Accounts Payable/Purchase Order Control
3. Budgetary Control/Encumbrance
4. Fixed Assets Accounting
5. Capital Expenditure Tracking
6. Forecasting & Modeling
7. Accounts Receivable
8. Foreign Exchange
9. Inventory & Purchasing
10. Payroll
11. Personnel Management & Reporting
12. ALLTAX™ Taxing System
13. ALLTAX Reporter™
14. Manufacturing Control System (MRP II)
15. Executive Peachpak™
16. Peachtree Software™ business systems for microcomputers
17. Peachtree Software™ office productivity systems for microcomputers

ALLTAX, ALLTAX Reporter, EASY-SCREEN, Executive Peachpak, Peachtree Software, and Extended Closed Loop are trademarks of Management Science America, Inc.

software. A revolutionary concept that lets executives get the mainframe information they need through their personal computers.

Talk to us

If we've whetted your appetite with our 15 questions, clip the coupon below.

We'll send you a concise booklet that will help you even more in your deliberations. We'd also like to send you more information on how MSA can help you plan for software. And on individual systems.

Just fill in the information below, or contact Robert Carpenter at (404) 239-2000.

Management Science America, Inc.
3445 Peachtree Road, N.E.
Atlanta, Georgia 30326.

- ☐ Please send me a free detailed brochure.
☐ Please send more information on the following systems. (Write numbers from product list)

Mainframe Computer Type/Model _____

Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

Business Phone () _____

CW17a(7/4/83)

MSA

The Software Company

